

The Magazine of Effective Compartmentation

Life Safety DIGEST

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Toronto Airport MEP Location

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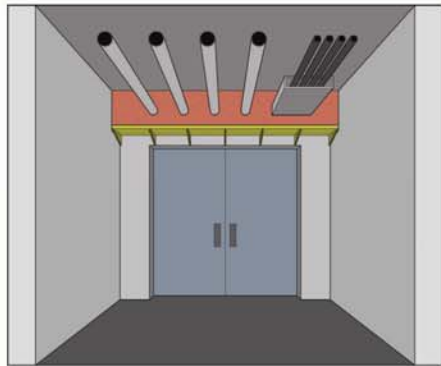
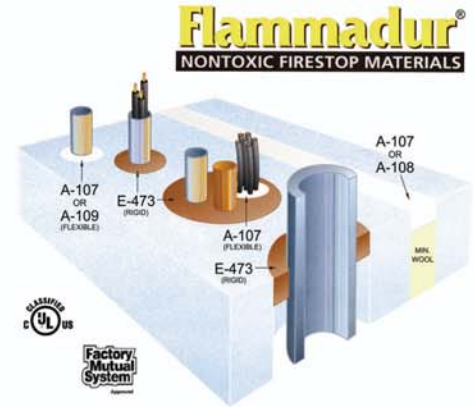
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On the Cover:

Firestop and compartmentation contractors help protect Chicago from suffering a fire like the one that devastated the city in 1871. Photo © Lee Balgemann Photographics, 708-771-9427 or e-mail lbalgemann@aol.com.

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Editors' Message

The Firestop Contractors International Association is pleased to present this third issue of Life Safety Digest, the Magazine of Effective Compartmentation.

Compartmentation is the fire protection system developed for buildings, ships, submarines and other structures to protect people and property from multiple threats. The concept involves dividing large areas into compartments, both horizontal and vertical, to contain fires to the room or area of origin until either automatic or firefighter suppression systems extinguish the blaze.

Important elements of compartmentation include fire-resistance-rated floors and -walls; firestopping protection around pipes, ducts joints and cables to protect openings, penetrating items and gaps; fire and smoke dampers limiting the spread of fire and smoke inside and around ductwork; fire swinging and rolling doors protecting large openings for entry and exit of spaces; and fire glass systems allowing transparency and fire resistance in areas where it's important to see what's on the other side of the wall.

There are new developments in the compartmentation industry. New contractor quality programs are starting to catch on, inspection and maintenance is getting better through National Fire Protection Association's NFPA 80 and ASTM Standards, while the industry is beginning to educate people and organizations about compartmentation.

Life Safety Digest's purpose is to offer an educational forum about effective compartmentation and structural protection while acknowledging that

all types of fire protection are needed to keep people safe in buildings...whether at home, in a shopping center, theater, hospital, nursing home, office, factory or most important, in a school.

Most important, compartmentation protects our kids at school.

FCIA is excited about this magazine's continued enthusiastic reception by architects, engineers, fire marshals, code officials and contractors. Use it as a reference tool and pass it on to others who should know about the importance of compartmentation. If you lose your copy, you'll find an archive of Life Safety Digest on FCIA's Website, <http://www.fcia.org> and clicking on "magazine."

Join the associations that support effective compartmentation and the FCIA because as a group, our education will establish fire and life with compartmentation as a key component. Compartmentation saves lives.

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Making the Right Pitch

by Steve Hahn

Bases loaded, two outs, bottom of the ninth that's a critical scenario that requires the right pitch.

And believe it or not, baseball is not the only situation to which that can apply!

Sometimes, a rolling fire door - especially an older one with a traditional tension release and mechanical governor system - is still in overall good condition. But, it just won't pass that darn drop test! If only somehow it could be made to drop at less than the 24 in. per second average closing speed mandated by NFPA-801!

Or maybe an otherwise acceptable fire door has a small part of its operating and closing system either broken or missing. NFPA-80 also requires that repair parts be obtained from the door manufacturer. What if the manufacturer is no longer in business or the design has become obsolete and parts are no longer available? Now what?

Those are two possible scenarios that could result in the need to completely replace a fire door. That can be costly enough when the door is installed on an easily accessible warehouse wall. But how costly would that be if the door is installed on the third floor of a high-rise building with the door guides concealed inside imported Italian marble columns and with the door coil mounted above some exotically detailed ceiling?

Telling a building owner the bad news that there is something wrong with his fire doors - and that the repair is going to take a lot of money - is not going to come across as a very good pitch no matter how true these conditions may be.

But there may be a solution - and

it's a much more economical alternative to the costly replacement of a complete fire door!

Retrofitting Fire Doors

Retrofit fire door operators are available to bring state-of-the-art technology to many existing rolling fire doors that just don't operate properly. They eliminate awkward and unreliable spring tension release mechanisms and replace traditional operating and governor systems. They also provide for automatic closing without a loss of spring tension and eliminate the need for traditional mechanical reset.

Retrofitting is a relatively simple process. The door stays in place with access needed only to each end of the door coil. The tension release system is disabled. The old operating and mechanical governor system is removed. The new retrofit operator is installed.

When retrofitted, even older doors can be tested and reset easily, operating with the reliability and extraordinary descent control found in the most advanced "new generation" fire door systems available today. Retrofit chain, crank and motor operators can be easily reset by simply reconnecting the fusible link release and reopening the door.

Systems are available to close the door after detector or alarm activation or are failsafe closing upon a loss of power and can be reset by merely clearing the alarm, restoring power and reopening the door. The most advanced detector/alarm activated systems will even close the door through the motor operator, stop the door if it contacts an obstruction during closing and continue closed when the obstruction is removed or revert



After retrofitting, a fire door has a simplified self-contained system with a release and governor integrated into the retrofit fire door operator.

to failsafe operation if power is lost.

So make the pitch for a retrofit fire door operator. Remember that it's not always the proper solution to all causes of improperly operating fire doors, but in most cases, it's a winner!

Notes

1 NFPA-80 Standard for Fire Doors and Fire Windows is the standard regulating the installation and maintenance of rolling fire doors.

2 Retrofit fire door operators are labeled for installation on many types and brands of existing rolling fire doors in accordance with their product approval listings. 🔥

Steve Hahn is Product Manager for Los Angeles-based Lawrence Roll-Up Door Inc. He has been in the rolling door industry for more than 30 years, is a member of the NFPA-80 Standard for Fire Doors and Fire Windows Technical Committee serves on three UL Standards Technical Panel and is past-president of the American Rolling Door Institute.

Lessons Learned: The Terminal 1 - New Project at Toronto's International Airport



The Lester B. Pearson International Airport in Toronto is undergoing a C\$ 4.4 billion project invested over 10 years.

by **Barclay Myers**

This article is first in a series that will explore the evolution of Compartmentation and Structural Protection & Life Safety at one of the largest firestopping projects ever conducted. We will explore the project through the firestop contractor's eyes and demonstrate how preplanning the routing of service piping, ductwork, cabling and structural supporting elements and compartmentation can have a huge positive impact on not only the quality, but the cost, of the finished construction product...a building.

In this installment we will provide background information about the project and key players involved,

layout some of the challenges faced by the project team in delivering complete firestopping coverage while looking forward to best practice improvements in the next phase. Future article topics in this series will cover trade co-ordination, tracking and record keeping, and systems development. The final article will discuss how the lessons learned during Phase 1 of the project lead to radical improvements in productivity, quality control and delivered value during Phase 2.

The Site: Taming of the Beast

In 1996 The Greater Toronto Airport Authority (GTAA) assumed control of Lester B. Pearson International Airport from the feder-

al government of Canada and immediately began the process of transforming the site while developing a master plan that will see over Can\$ 4.4 billion invested over 10 years.

Like most modern airports, Pearson is a mixed use facility handling in excess of 25 million passengers (40% of Canadian air travelers) and 325,000 tonnes of cargo annually. The goal of the Airport Development Program (ADP) is to increase capacity to 50 million passengers and 675,000 tonnes of cargo by 2020. In 1999, Pearson became the first North American airport to be certified to the coveted ISO140001 international environmental standard.

The four major project areas of the ADP are:

Utilities and Airport Support: new central utilities plant, new police building, 2 new fire halls and a fire training facility.

Airside Development: a fifth and sixth runway, new taxiways, runway extensions and a dual taxiway system.

Infield Development: new deicing facility, 10 gate infield terminal, and relocation of existing cargo and hangar facilities and a 4-lane tunnel under Runway 15L /33R to facilitate easier access to the terminal aprons.

Terminal Development: 12,600 space parking garage (North America's largest), 64 bridges and the equivalent of 50 miles of single lane road, Automated People Mover connecting terminal 1 and 3 to the offsite parking lots.

Upon its completion the new terminal building will have the following:

- A gross floor area of 82 acres.
- 258 passenger check-in counters in the main departure hall.
- A baggage handling system with 15 kilometres of conveyor that can handle 18,000 bags per hour.
- Enough concrete to build two CN Towers.
- More than three and a half times the amount of steel used to build the Eiffel Tower.

The Players: A Litany of Partnerships

Owner: Greater Toronto Airports Authority (GTAA) has a mandate to operate and develop the airport facility. They put into place the Airport Development Plan of which the new Terminal 1 building is a part.

Authority Having Jurisdiction: One of the most unique aspects of the project is that the Airport is situated on federally owned property and therefore does not fall under control of a local municipality; rather, the GTAA retained the services of LMDG Building Code Consultants Ltd. to act as the "Authority Having Jurisdiction". LMDG is an independent firm specializing in fire and life safety consulting. Ultimately it was LMDG that would recommend whether or not an occupancy permit would be issued to the project

Designer & Consultants: The ADP program managers is a joint venture between Marshall Macklin Monaghan and Giffels Associates Limited called MGP Project Managers (MGP). They oversee all construction on the airport site. The architect of record for Terminal 1 - New project is also a joint venture; Airport Architects of Canada is a partnership between Adamson Architects of Toronto, Skidmore Owings and Merrill LLP of New York and Moshe Safdie Associates, Ltd of Montreal. Electrical engineering was

done by Mulvey & Banani International, Inc. with the mechanical overseen by yet another joint venture of The Mitchell Partnership, Inc. in association with Smith & Andersen,

Construction Manager (CM): Yes, you guessed it another joint venture. This time two of Canada's largest construction firms, PCL Constructors and Aecon Group Inc., joined forces to tackle the project. At the peak of construction they oversaw and coordinated the activities of 2,300 tradespeople. The CM played a crucial role in implementing the procedures and processes necessary to achieving full compartmentation.

Specialty Firestop Contractor: Custom Insulation Systems (CIS) of Concord, Ontario was awarded a design, build and certify contract for the firestopping of all mechanical and electrical services penetrations and all interior architectural joints. CIS is one of the largest mechanical insulation contractors in Ontario and has been performing firestopping as a value added service for almost 20 years. The Terminal 1 project was its first truly firestop only project. Due to the success of the airport project CIS formed a stand-alone company called Nexlevel Construction Solutions Inc.

Manufacturer: 3M Canada Fire Protection Products worked with CIS during the initial tendering and proposal process and became an integral part of the project team. 3M also provided valuable technical assistance to the project.

Bring on the Challenges

The contract that CIS was awarded was different than that first envisioned by the construction manager and architect. The thinking was that the project would need a very complex system to manage the firestopping activities and that there was no



Stair pressurization duct is shown going through block.



Various pipes include insulated and metal pipe.

firestop contractor capable of providing this level of sophistication. So initially the major firestop manufacturers were asked to act as technical and construction manager for the firestopping work, bringing aboard contracting companies as needed to provide the labour. However this was out of the realm of experience for the manufacturers and they had concerns regarding this lack of experience and undertaking liabilities as a contractor.

In the end CIS with the help of 3M Canada was awarded a unit price contract as a prime contractor reporting directly the construction manager. The initial budget of \$4 million meant large capital and bonding requirements to get over 30,000 firestops installed to the tested and listed systems.

Some of the design goals for the firestopping portion of the project were....



Fireproofed beam through block is shown.

Fig 1

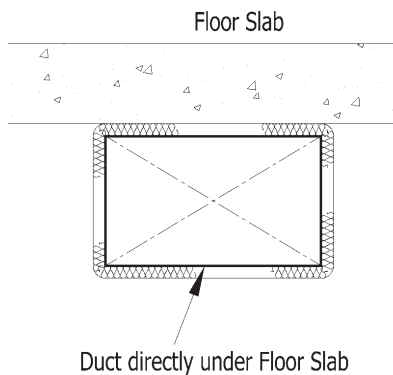
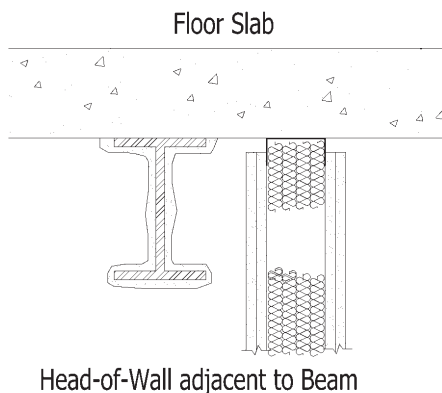


Fig 2



Verifiable Complete Coverage: Develop trade co-ordination processes to ensure firestopping was correctly installed and documented before being enclosed by further construction. Similar to a framing inspection for the drywall trades.

Quality Assurance: All firestopping was to be installed with “zero-tolerance” in regards to the approved firestop systems designs. Once a design was decided for each application no deviation from the design was allowed.

Limited Equivalencies or Engineering Judgments: the project could not “design” its way out of a problem created by poor penetration preparation, workmanship, or carelessness.

Complete as-built records: To help airport maintenance personnel maintain the fire compartmentation on an ongoing basis, a program to record every firestop was needed. During the development of this program a number of issues arose, both internal to the firestopping team and external within the larger project.

First among the concerns was the interaction and coordination of the firestopping activities with the other trades. Typically the last thing an electrician is worried about is how to firestop around a conduit run that penetrates a fire compartment wall or floor. In fact, it is possible to install most building elements in complete compliance with the codes and specifications for that element but make it virtually impossible to firestop correctly.

Phase One

On phase one of the airport, there was no preplanning of where penetration and structural items penetrated compartmentation walls and floors, to locate where firestopping was to occur in the building. To gain access to many of these firestops,

much reworking of already installed construction had to take place. For instance, walls were moved after they were in place, and electrical and mechanical penetrating services were relocated either temporarily or permanently. These activities added unplanned costs into the hundreds of thousands.

Some examples of the situations found are below.

Fig.1 shows an insulated mechanical duct as being installed tight to the underside of the floor slab. This is a typical practice used to gain maximum utility out of the planned building spaces. However when this duct passes through a fire resistance-rated compartment wall, it creates a condition that cannot be firestopped using a system that has been tested and listed in accordance with any firestop standards.

The testing of the duct would come under those standards used to test through penetrations, but due to its location the opening around the duct bleeds into the architectural firestop joint which is tested using different methods. From a firestop perspective, this duct should have been installed into a separate opening that is independent of any other opening, joint or breach in the wall.

Fig.2 shows a similar situation as fig.1., Conduit and small pipe are regularly installed in “runs” by attaching them to the underside of the floor structure. Just like the duct, this condition presents a difficult situation for the firestopping contractor, as there were no tested and listed systems for the application, and access was difficult to say the least.

Barclay Myers is Manager of Business Development for Nexlevel Construction Solutions, Toronto, Ontario, Canada. He can be reached at Barclay.myers@nexlevel.ca.

Effective Compartmentation Technology Report: Fire/Smoke Dampers

by Tom Edwards

Effective compartmentation is properly designed, installed, inspected and maintained fire-resistance-rated wall and floor assemblies, firestop systems, fire glass, fire swinging, rolling doors and fire/fire-smoke dampers all working together as one system limiting fire and smoke to the room of origin.

According to the National Fire Protection Association, fire deaths due to smoke inhalation outnumber deaths due to burns by a ratio of 2-to-1 according to death certificates from 2002, and by a ratio of 3-to-1 according to death certificates prior to 1999. It is also estimated that smoke inhalation is the primary cause of death in 60 to 80 percent of burn victims each year.

Firefighters are not immune to the danger. According to the National Fire Prevention Agency, 2,890 firefighters were injured from smoke inhalation in 2003, often due to thrusting themselves into the hazard. In Section 101.3 (Intent) of the 2000 International Building Code (IBC), then 2003 and remaining in the 2006 code, a section was added to address firefighters and first responders.... "a reasonable level of safety for fire fighters and other emergency responders."

By definition, inhalation injury is the aspiration of superheated gases, steam, hot liquids or noxious products of incomplete combustion that cause thermal or chemical injury to the airways and lungs. The combustion of all natural and manmade

products results in the production of various chemicals, including hydrogen cyanide, aldehydes, hydrochloric acid and acrolein, which produces changes in the airway and lungs that comprise inhalation injury.

The presence of inhalation injury doubles the predicted mortality rate associated with any size burn in all age groups. Once a fire reaches flashover, production of carbon monoxide and hydrogen cyanide increases, consumption of oxygen intensifies and incapacitating conditions are induced within two minutes, possibly causing death of those exposed within 10 minutes.

Fire and Smoke Risk Factors

On Nov. 28, 1942, many patrons of the Coconut Grove nightclub in Boston were trapped inside a building and overcome by smoke. Most of the 492 deaths were due to smoke inhalation, as were most of the subsequent deaths among hospitalized victims.

Almost 40 years later, 84 deaths and 679 injuries resulted from smoke spreading through seismic joints, pipe chases and duct shafts in the MGM Grand Casino fire in Las Vegas - with the majority of deaths and injuries occurring in upper floors far from the source of the fire originating in a restaurant area.

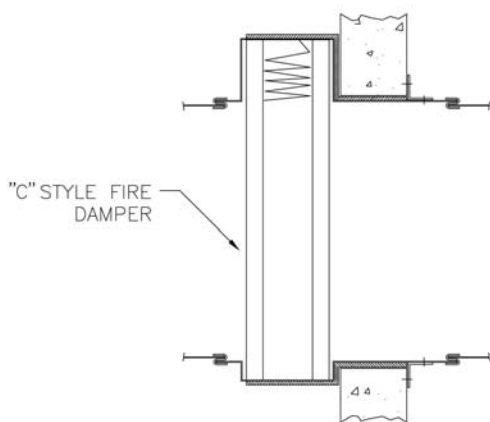
Although these fires are famous due to their size and press coverage, the people at risk for inhalation injury are those who are asleep. When a fire starts in a building and people are in unfamiliar areas, in deep sleep, they may not be orient-



Curtain Fire Damper



Multi-Blade Fire Damper



C-Style Fire Damper. Note insulation to extend rating of damper outside the wall.

ed to find their way out quickly.

Effective Compartmentation is Needed

Dr. John Klote, a fire and smoke control consultant in McLean, Va., stresses the importance of stopping smoke.

“From a primary standpoint, even under successful sprinkler suppression, smoke is still generated and can travel through duct openings if not properly isolated,” he said.

Fire Dampers vs. Combination Fire/Smoke Dampers and Compartmentation

Technology in fire, smoke and fire/smoke dampers has advanced light years recently due to testing systems that reflect the field application of these systems.

Fire dampers are devices installed in fire-resistance-rated walls and - floors to protect fire from spreading within the duct or outside the duct in the annular space between the metal and the wall/floor. Dampers are designed to assist the mechanical designer with effective compartmen-

tation needs.

There is a significant difference between a “fire damper” and a “combination fire/smoke damper.”

A fire damper closes once duct temperature reaches a high enough level to melt a fuse link. A combination damper closes based on a high duct temperature or upon a smoke detector signal.

Additionally, fire dampers are not air/smoke leakage rated by Underwriters Laboratories (UL) to stop smoke. A smoke damper, or combination fire/smoke damper, is a leakage rated device that limits the amount of smoke that may move in an assembly.

The 2003 IBC recognizes the importance of stopping smoke by requiring combination fire/smoke dampers in shafts penetrated by ducts or transfer openings for all building classification types.

Smoke dampers are required at each point a duct or air transfer opening penetrates a smoke-resistance-rated corridor, commonly known as a smoke barrier. Smoke barriers are defined as hourly resistance rated, yet resist the passage of smoke.

Additionally, smoke-proof enclosures or pressurized stairways must be provided in buildings with a floor surface located more than 75 ft. above the ground or 30 ft. below the level of exit. This is designed to minimize smoke migration, smoke damage and allow a safer exit for building occupants in emergency situations.

In Section 716 of the IBC, leakage ratings for smoke dampers, which include combination fire/smoke dampers, will not be less than Class II (less than 10 cfm/sq. ft. (cubic feet per minute/square foot) at 1-in. static pressure. Elevated temperature ratings for this leakage class cannot be less than 250 degrees Fahrenheit above ambient temperature.

Fire, Smoke, and Combination Dampers Application Summary

Smoke Dampers are operated by a factory installed electric or pneumatic actuator. They are controlled by smoke detectors and/or fire alarms. Smoke dampers are qualified under UL Standard 555S, Smoke Dampers, and are designed to resist the passage of air and smoke. Smoke dampers have two general applications:

1. “Smoke control system” - Smoke Dampers close upon detection of smoke and prevent the circulation of air and smoke through a duct, transfer or ventilation opening.

2. “Engineered smoke control system” - Smoke Dampers are designed to control smoke migration using walls and floors as barriers to create pressure differences. Pressurizing the areas surrounding the fire prevents the spread of smoke in to other areas.

Smoke dampers have the following installation requirements:

1. Location: Smoke dampers are for use in or adjacent to smoke-resistance-rated construction, installed no more than 24 in. from the smoke barrier. Smoke dampers that are used to isolate air handlers are not limited to this distance requirement. NFPA 90A states that smoke dampers are to be used to isolate air handling units over 15,000 cfm.

2. Sleeves and Attachments: Smoke dampers do not necessarily have to be installed in sleeves, and can be installed directly in the duct. The manufacturer’s installation instructions will include the approved method for attachment and spacing of the attachment.

3. Sealing: The joints between the damper frame and the duct must be sealed to prevent unwanted air leakage. Smoke damper leakage ratings are based on leakage through the blades and not additional leak-

age between the damper frame and duct or sleeve.

Fire Damper Application Summary

Fire dampers are installed in a wall or floor, at the point of duct penetration, to retain the integrity and fire resistance-rating of a wall - whether it is a ducted or open-plenum return application. Fire dampers are equipped with a fusible link (rated for 165 degrees F up to 286 degrees F) which "holds" the blades or curtain open until it melts. When the fusible link melts, the blades close and stop the flame from moving into an adjoining compartment.

Fire dampers are available in two basic designs, curtain type and multiple blade type.

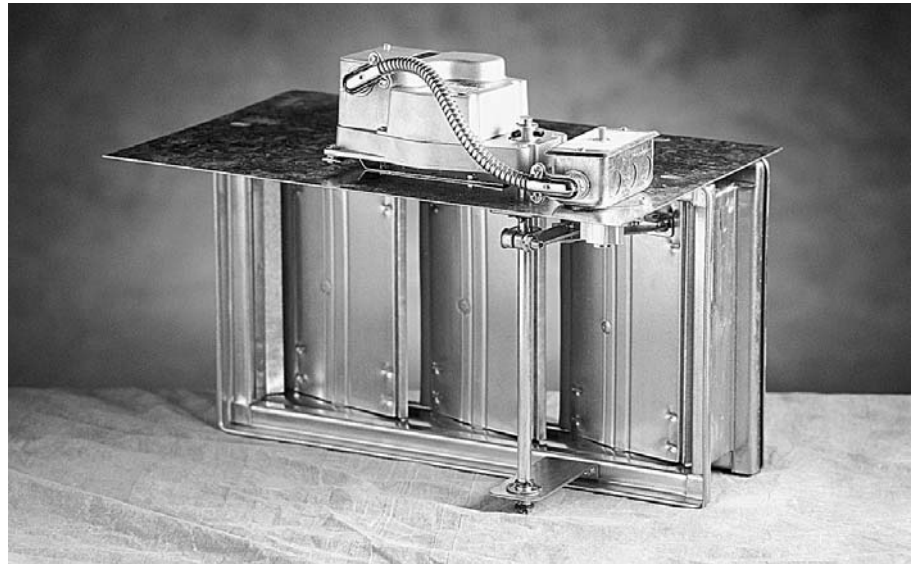
Curtain type dampers (see photo 1) consist of a "curtain" held up by a fusible link. Multiple-blade-type dampers are similar with "blades" located in the air stream, and generally offer greater restriction to air flow than a curtain-type fire damper for the same size duct.

However, multiple-blade-fire-dampers (see photo 2) can be applied in situations when the system air velocities exceed the curtain type fire damper closure ratings. Multiple-blade fire dampers have been UL tested and are dynamic rated for closure at 4,000 feet per minute and 8 in. of water.

There are two types of applications for fire dampers, both static and dynamic.

Static fire dampers can only be applied in HVAC systems that are designed to shut down in the event of a fire. Dynamic fire dampers have been tested for closure under air flow and carry both an air flow velocity (fpm) and pressure differential rating.

The minimum rating for all dynamic fire dampers is 2,000 fpm and 4 in. of water. The minimum



Fire Damper actuator mounted on damper assembly.

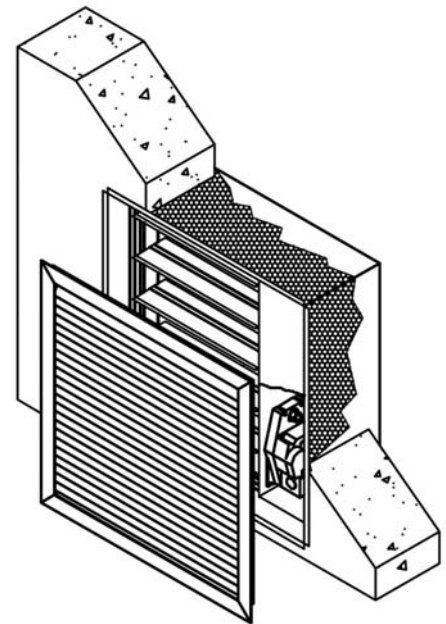
ratings are based upon closure at a minimum air flow of 2,400 fpm and 4.5 in. of water. Higher ratings than the minimum are established in increments of 1,000 fpm and in increments of 2 in. of water.

Combination Fire/Smoke Damper Application Summary

Combination fire/smoke dampers meet the requirements of both the UL555 fire damper and UL555S smoke damper standards and application requirements as described above. They are used in HVAC penetrations where a wall, floor or ceiling is required to have both a fire damper and smoke damper.

Fire/smoke dampers close upon heat detection (via duct temperature) or smoke (via a smoke detector) and "seal" the opening. Unlike regular fire dampers, fire/smoke dampers are available with electric heat release devices instead of fusible links. The electric release devices are "re-settable" and allow the damper to close in a "controlled" manner, rather than "slamming" closed causing problems with the HVAC system.

Fire/smoke dampers designed



Fire/Smoke Damper for corridor applications.

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More information on fire safety available from:
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with air foil blades may perform better (less pressure drop) than others. Less pressure drop in a system can mean energy savings. System designers should consider selecting fire smoke dampers that “certify” their performance through a third party like the Air Movement and Control Association.

Fire and Combination Fire/Smoke Dampers - Means Increased Application Flexibility

Recently, many damper system designs - especially combination fire/smoke dampers - have increased their application and installation flexibility. The number of UL tested systems available has increased dramatically.

These designs have made it easier to select and install the right damper without creating undue burden on the engineer, contractor and the authority having jurisdiction (AHJ). As with all compartmentation systems, it is important that the damper manufacturer's approved installation data sheets and tested and listed systems documentation be available for installers and the AHJ for the project.

Over the past few years, many important design and application changes took place to make it easier to design, install, inspect and maintain fire and combination fire/smoke dampers:

1. One-sided angle installation: Until recently, all fire and combination fire/smoke dampers required mounting angles on both sides of the wall. Damper systems' designs are now UL approved with a mounting angle on one-side only - cutting damper installation time in half. This applies to both rectangular and round dampers.

2. Damper to sleeve connections: Installation instructions are required to show attachment meth-

ods of the damper to the sleeve, plus the spacing of attachments for UL-compliant breakaway connections. Newer damper designs have been tested to accommodate various flanged connection combinations to comply with UL's breakaway requirements. This permits the contractor to use any flange type and not worry about a special connection to the damper sleeve.

3. Out-of-the-Wall (see illustration 1): For years UL damper installations were approved only if the damper blades were located in the wall assembly. Occasionally, “hidden” items (i.e., hydronic piping, ductwork and cables) interfered with the clearance of the damper actuator. Newer designs accommodate installation “out-of-the-wall” by 8 in. The damper sleeve is wrapped with a heat-resistant material that effectively extends the wall rating to the damper.

4. Vertical-Bladed Installation (see photo 3): Another method to assist in eliminating interference is with a damper designed with vertical blades. This permits access of the actuator from below or above the damper and is especially important with side-by-side ducts. This configuration also permits a slightly lower pressure drop on multistory supply shafts.

5. Corridor Fire/Smoke Dampers (see illustration 2): Since codes require that some corridors be protected with fire/smoke dampers, many tested systems have been developed to permit installation from the corridor. In these designs, dampers can be mounted and fastened directly to the wall or floor - without traditional mounting angles and without traditional expansion gaps. Aesthetically-pleasing flush-mounted grills provide both airflow and a means in which to access the actuator without mounting an access door in the corridor.

6. Underfloor Dampers: Installation

methods are now approved that eliminate the 1-1/2-in. mounting angle around the perimeter of the damper. This opens about 3 in. of space, often critical for underfloor applications. The damper height can now be maximized to minimize pressure drop.


7. Firestopping Eliminates Angles: Installation methods are now approved that eliminates the 1 1/2-in. angle around dampers. This is a big development, and not all damper manufacturers have this capability.

8. Maximum Damper Size: Maximum UL-approved damper sizes have increased in recent years. This is especially accommodating on large open-air returns in many commercial, industrial and institutional occupancies.

These maximum size limitations are based solely on dampers that were tested to meet UL555 requirements. Maximum sizes for vertical installations may be different from maximum sizes for horizontal installations. By maximizing these UL-approved sizes, it can eliminate the extra cost of subdividing ductwork.

Summary

Stopping smoke from migration through HVAC systems is important to save lives and minimize property damage.

Rest assured that the best in compartmentation technology has been used in fire, fire/smoke and smoke dampers in the buildings where you live, work and visit...and is now more competitive than ever based on advancing technology and testing in this important fire and life safety feature of effective compartmentation. 

Tom Edwards is president of Ruskin Co. and past chairman of the Air Movement and Control Association. He can be reached at tomedwards@ruskin.com.

Firestop Systems Contractor Quality and Inspection: A Standard Process

by Aedan Gleeson, Bob LeClair
and Don Murphy, FCIA

In March 2000, the International Code Council's Mike Pfeiffer, vice president of codes, recommended that the firestopping industry start to develop standards for quality in firestopping.

With that challenge, Don Sabrsula, the Firestop Contractors International Association (FCIA) Standards Committee Chair (2000 - 2005) and president of Houston-based FireSafe, worked with industry contractors and manufacturers to assemble and ballot the first standard for inspection of firestopping.

ASTM E 2174-01 is born and ASTM E2393 Evolves The ASTM E 2174, "Standard for On-Site Inspection of Installed Fire Stops," was founded from the "Quality Process Approach."

It's designed to be part of the total quality protocol needed for zero tolerance firestop systems installation. Firestop manufacturers test their products, manufactured to strict tolerances and publish systems suitable for use as firestop systems in the Underwriters Laboratories (UL and cUL), Omega Point Laboratories (OPL), Warnock Hersey International, (WHI) and Factory Mutual Approvals (FM) directories.

In the construction industry, there have been several articles on "Construction Process Quality," including in publications such as Engineering News-Record. At the CSI Show in April 2005, Patrick McLeamy,

COO of HOK Worldwide, had the keynote presentation on construction quality at the event and compared it to the manufacturing industry.

To provide a construction process installation protocol program, the FCIA created a standard for quality process in the construction subcontracting industry: Factory Mutual Global, Approvals Division's, and FM 4991 - Standard for the Approval of Firestop Contractors and ASTM E2174-01 Standard Practice for On-Site Inspection of Installed Fire Stops.

Later, ASTM E2174-01 was updated to ASTM E2174-04. Then, the standard was augmented with a standard for inspection of joint systems for walltops, expansion and construction joints and perimeter fire protection, ASTM E2393-04, Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers.

FM 4991, also listed nationally in many specifications due to reference in MasterSpec and BSD SpecLink, is a quality-process audit program where the contractor has a "DRI," or designated responsible individual. The DRI passes an industry test based on the firestop industry's Manual of Practice (MOP), tested systems selection and the FM 4991 Standard. The DRI manages the firestop contracting firms' processes, policies and procedures to result in installed firestop systems that meet the tested and listed system published in the testing directories.

During the FM 4991 approval



FM Approvals sets the stage
with FM 4991



ASTM inspection standards vital to the
firestopping quality process

process, FM Approvals visits the firm, audits its quality manual and checks the installed firestop system in the field through destructive testing to verify the paperwork's validity. Follow-up audits are done yearly by FM, with the same destructive testing employed by FM personnel. Effective quality programs have a procedure for the production process and sampling to be sure the process works. ASTM E2174 / E2393 are the check and balance that samples the production process for firestop installation, FCIA member, and / or FM 4991.

The FM 4991 Program is quite affordable for a contractor. Initial cost is about \$6,000 for the audit and approximately \$1,500 for the follow up audit yearly.

CEUs are required for the DRI to maintain his or her status in the program. And, FM does not issue an FM 4991 contractor firm approval to individuals, only the firestopping firm.

UL Announces New Firestop Contractor Program

UL announced the new Firestop Contractor Program at the FCIA Firestop Industry Conference in November 2005.

In April, UL held its first testing of DRIs to determine who would manage new qualified contractor firms' processes at the FCIA Education and Committee Action Conference.

Another testing opportunity will be held at the Firestop Industry Conference & Trade Show, in Charleston, S.C., on Nov. 9 through 11. Contact FCIA for more information about this opportunity.

The new UL program affirms that the subcontractor quality process is gathering momentum. Both the FM 4991 and UL programs offer audit inspections of the firestop contractors' quality processes, with field

verification during an audit. Specialty firestop contractors now have a way to separate themselves from others who have not embraced the quality process.

Why Bother to Become Approved?

There are several reasons contractors choose to become FM 4991-approved or UL Firestop Contractor firms.

Aedan Gleeson, the FCIA accreditation chair, reports that specifiers in the Northeast have added FM 4991 and ASTM inspection to projects with many of the specifications actually resulting in an FM Contractor awarded the work.

"We even looked at bidding a project in Dubai, United Arab Emirates, that had a requirement for an FM 4991 Contractor, making this program truly international. Most important, contractors are paying attention to fire and life safety through this quality process."

Contractor Quality Manuals

A contractor must review its processes, procedures and people to write a quality manual.

The firm's organization processes are reviewed, including the time the estimate takes place to project award, communication, installation and inspection of the work.

Bob Svoboda of S&W Waterproofing in Kansas City, Mo., said, "Going through the FM 4991 process and building a quality manual made us look at all of our processes for efficiency and quality. We made many changes to what we do and how we performed. The result is that we are a better company for going through this FM 4991 approval quality process."

Contractor quality manuals are to be written to reflect the firms' procedures. They are not policies that are forced upon the contractor by



Contractor without quality process. Inadequate firestopping may result.



The quality process helps firestopping keep compartment sealed. (Photo courtesy of Grace Construction Products)

either FM or UL, but really how the firm selects systems, communicates the appropriate systems to the field, then assures that the firestopping is installed to tested and listed systems and engineering judgments by manufacturers, testing laboratories or fire protection engineers. Each firm will have their own way of handling the quality process. It's the basis of the free enterprise system that each quality program would be unique because it's the firm's competitive advantage how they are organized to execute a contracted firestopping project.

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Quality is the Whole Process

ASTM E2174, ASTM E2393 inspection protocols and FM 4991 and UL's Contractor Program are a package that clearly states in the contractor quality manual the installation protocol of firestop systems to result in better overall project quality.

ASTM E2174 and ASTM E2393 can be used without a specialty firestop contractor or an FM 4991 Approved or UL qualified firestop contractor on projects that use the "he or she who pokes hole fills it" protocol.

However, the inspection will cost much more when used with the multiple trade method, as it's difficult to manage anywhere from two to 40 subcontractor firms that touch effective compartmentation with their joints, penetrating pipes, ducts and cables. Inspectors tell FCIA that the inspection costs rise dramatically due to multiple trades involved and submittal package variances to field applications and that the amount charged for inspection can be staggering.

As contractors, we believe in the complete approach. This includes specialty firestop contractors providing quality services for firestop systems installation, with inspection by qualified inspectors to verify that the process works and offers value to the purchaser of firestopping through process efficiencies.

Investment in the correct contractor, with processes that result in systems installed in the field as documented, means value is received for products, systems and services, rather than heavily weighted in inspection.

Architects, specifiers, engineers, building code officials and fire marshals should consider specifying tested and listed firestop systems made by quality

manufacturers, installed by a specialty firestop contractor (an FCIA member, or course) or FM 4991 approved or UL qualified firestop contractor and inspected to ASTM E2174 and ASTM E2393 to make the total quality management process complete.

Below is some FCIA suggested specification language from the FCIA Specification on <http://www.fcia.org> on contractor qualifications:

Contractor Qualifications: 1. FM approved in accordance with FM Standard 4991 - Approval of Firestop Contractors and/or UL Firestop Contractor Program.

2. Licensed by the state or local authority, where applicable.

3. Shown to have successfully completed not less than five comparable scale projects.

4. Firestop Contractors International Association contractor member in good standing.

Inspection


A. Inspection is the independent inspection agency employed and paid by owner to examine penetration firestopping in accordance with ASTM E2174, "Standard Practice for On-Site Inspection of Installed Fire Stops." In addition, the ASTM E2393 inspection agency is to examine firestopping and will determine that firestopping has been installed in compliance with requirements of tested and listed firestop system and that the installation process conforms to FM 4991 - Standard for Approval of Firestop Contractors.

B. The inspector will advise the contractor of any deficiencies noted within one working day.

C. The enclosure of firestopping with other construction is not done until the inspection agency has verified that the firestop installation complies with requirements.

D. Where deficiencies are found, the repair or replacement of the firestopping is done so that it complies with requirements of tested and listed system design.

E. The firestop inspector may not be related to installing contractor firm, including arms length business relationships. This pertains to subsidiaries, distributors, manufacturers' representatives or manufacturers supplying products for use in firestop systems.

Please note that the FCIA is working with ASTM to develop a standard on qualification of inspectors. Standards for production quality and inspection are making tracks in the construction industry. FCIA is pleased to have lead the industry with programs for contractors from FM & UL, and a set of inspection documents from ASTM. Watch for this trend to continue as the industry matures. 

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Don Murphy is president of PPMI Firestop Inc. in Indianapolis and FCIA president and can be reached at don@ppmifirestop.com. E-mail info@fcia.org for more information about the "Firestopping Quality Process."

Optimization of Fire Protection Systems: Great Use of Resources or Public Safety Risk?



Fire glass protects compartmentation's integrity while allowing occupants to see what threat may be on the other side of the barrier.

by **Bob LeClair, FCIA Past President**
and **Bill McHugh, FCIA Executive Director**

In the last 20 years, our economy has become much more global than ever. Competition in many industries – automotive, computers, electronics, and construction products have driven firms to get competitive or die.

Construction of buildings is no different. Firms are searching the world for places to build manufacturing, warehousing, customer service, engineering and headquarters facilities, instead of just in a few North American states or provinces. Economists call this process the optimization of resources which seeks the lowest cost for the value received in the free enterprise system. This economic optimization process has made the passion to be the best and most economical a key focus of companies and societies worldwide. The economic optimization process has had a profound effect on firms' decision making behavior. The concept has had successes and some stumbling blocks to deal with along the way.

Optimizing Failures

Over optimizing can be a disaster. Under optimizing can mean products that are not competitively priced in world markets. There has to be a balance somewhere between optimization for competitive rea-

sons, creativity and safety in the finished product or system.

Remember the Ford Pinto gas tanks in the 1970's or Corvair's rear end configuration problems in the 1960's and the loss of life from each of these events due to parts that turned out to be over optimized? Remember general auto quality in the early 1980s when we were driven to overseas auto manufacturers for our new cars?

Short term profits from each of these manufacturing and or design optimizations caused loss of life and shareholder value all aimed at saving a buck.

User Feedback Mechanisms

In the automotive industry, end users respond quickly to flawed engineering or parts in cars by showing up at the dealers' service departments. Data is gathered on each vehicle to find sub-par performing parts from the dealer level straight to the manufacturer through incident reports online.

The information sends an alarm flag through the firm's product stewardship process, and a search-and-destroy mission is launched to find and repair the problem. In the manufacturing environment, this process moves efficiently as long as the distribution channels are clearly identified and tied into the quality process.

In construction and particularly in fire protection, feedback mechanisms may not be as efficient as in the automotive industry, and defect or flawed engineering discovery may be slower.

Cars are driven daily and serviced in tightly controlled, franchised dealerships when they are relatively new, with excellent quality tracking mechanisms.

In the construction industry, fire protection systems are designed by one firm, tested by another, installed by a third party and



Compartmentation is penetrated by service piping. Ratings are restored using firestopping, fire dampers, fire doors and fire glass.

inspected by yet another organization...and each operation has a separate, independent profit objective. Communication systems that exist in manufacturing may not be as continuous in construction. In construction, the layers of contractors may simply repair a defect, and move on rather than report back to the manufacturer through a distributor or dealer.

The auto and other manufacturing industries embraced the quality process through ISO 9000 certification of their processes in the 1990's. Once a product produced under an ISO 9000 certified process leaves the building product manufacturer's facility and moves into the distribution channels there may not be further ISO standards followed in the distribution and installation of these building products. In construction sub-contracting, the quality process is not fully developed yet. If fire and life safety systems like alarms and detection, sprinklers, effective compartmentation and structural protec-

tion are very sensitive to installation tolerances, then shouldn't the same quality process be used from manufacture to installation and inspection? And, if the construction industry is optimizing fire and life safety systems, shouldn't there be greater attention paid to field installation to result in tested and listed systems being installed to exacting, zero tolerance specifications?

To meet zero tolerance specifications, FCIA worked with FM Approvals to develop FM 4991, the Standard for Approval of Firestop Contractors. UL is developing a UL Firestop Contractor Program as well. Both programs are aimed at bringing the quality process to construction, starting with firestopping...and recognizing the unique environment in construction.

Optimizing Choices

- Adding automatic sprinklers to buildings
- Eliminating the use of fire-resistance-rated effective compartmentation



A rolling door is an effective method of compartmentation.

tion and structural fire protection through significant “trade offs” for automatic sprinkler protection

- Adding automatic Sprinklers eliminates requirements for fire extinguishers

For many of these optimized systems, a single component's performance is critical to the safety of the almost all other components in the structure. If one part of a system has a weakness, complete failure may be the result due to the over optimization of systems. For many optimized systems, a single component's performance is critical to the safety of the almost all other components in the structure. If one part of a system has a weakness, complete failure may be the result due to the over optimization of systems. Without backup, a minor event may turn into a major event.

The Building Fire Research Laboratory, National Institute of Standards and Technology (NIST) have recommended to industry and the code development process that

more “balance” to fire protection design using effective compartmentation, structural protection, sprinkler systems, alarms and detection and occupant education be required in buildings to reduce risk from lack of redundancy and robustness.

And, for many of these systems, products have to become systems through installation to zero tolerance application.

Questions about Optimizing Life Safety

Therefore, when designing systems for life safety protection of a building, does it really make sense to fully optimize the fire protection systems? Is it worth dollars if fire and life safety may be at risk?

Statistics show low loss of life and good fire performance of office buildings in the past based on construction designs with significant redundancy (fire resistance rated, detection, alarms, and sprinklers). An NFPA Study on high rise building fires from 1985 to 1998 for all high rises in the U.S. showed as few as seven fatalities, it was reported at ICC's code hearings recently.

Some buildings that produced these excellent performance statistics were constructed with some effective compartmentation in floors and walls, and at least two-to four-hour structural protection and up to three hour compartmentation requirements.

The 1920's art deco LaSalle Bank Building experienced a fire in 2004. The LaSalle Bank building in Chicago had fire burning for more than five hours before extending to the floor above. And, the structure above and below the fire floor remained structurally sound. The structure was reoccupied shortly after the debris from the fire was cleaned...showing real success of

effective compartmentation and structural protection.

Buildings constructed under new codes may or may not have the same degree of effective compartmentation and structural protection as the LaSalle Bank, yet still meet minimum code requirements. Still, building owners can choose to build structures equal to or greater than the minimum required by code.

Codes dictate a minimum level of safety and performance requirements in buildings. Sprinkler systems have been used as trade offs to significantly reduce the hourly fire resistance ratings for compartmented floors and walls in addition to structural fire protection components.

With this in mind, a question needs to be asked: How far do we want to push the envelope with optimization of building construction systems when it comes to fire and life safety, property protection and continuity of operations in a built environment? Is building to code enough to meet demands of the public for safety?

While the Firestop Contractors International Association supports the use of alarms and detection, occupant education, sprinkler systems and effective compartmentation plus structural fire protection, we also support the content of the World Trade Center Study by NIST. Extrapolating from the WTC study by NIST, it may be said that the optimization process used to set requirements for fire resistance rated assemblies may have gone too far optimizing these important fire and smoke barriers and structural protection by removing necessary layers of redundancy in buildings.

Here's why. Buildings constructed in a large area of the U.S. over the past 50 years under the Uniform Building Code (UBC) and other

Codes used effective compartmentation, structural fire protection, detection, alarm systems and sprinkler systems as their fire protection methods for defending a structure from fire and life safety risks.

To bring the three model codes together from the U.S. into the International Building Code, the new code could not, upon adoption, put a percentage of the map into non-compliance the moment the new code was adapted.

Therefore, the lowest requirement for effective compartmentation and structural protection where sprinkler systems were used as a "trade off" was accepted as the primary source of protection for buildings in the U.S. Whether we agree or disagree, this is the new level of compartmentation and structural protection required in buildings for fire and life safety.

To justify the high level paradigm shift in code philosophy, statistics for sprinkler performance were used as a basis for the change.

At the ICC Code Committee hearings in Cincinnati, February 2005, it was cited that reported fatalities from 1985 through 1998 were only 39 in 14 years in business/high rise occupancies. From 1994 through 1998, NFPA statistics were reported that no fatalities occurred in hotels and motels with sprinkler systems where they operated.

Additional NFPA statistics have shown that fire deaths have gone down over the past 20 years in office occupancies. Since occurrences of fire may have taken place in new and old buildings alike, these fatality statistics may not reflect the true facts. Could the statistics have been produced in buildings that had been constructed using effective compartmentation and structural protection, detection and alarm systems, occupant education

plus sprinkler suppression systems all working together? The new codes may have recognized the success of fire protection but removed an important part - effective compartmentation and structural protection through height and area tables that allow for larger spaces without either type of protection and the elimination of fire resistance rated compartmentation in corridors and some tenant spaces.

What new fire loss statistics will this new generation of building without effective compartmentation and structural protection bring to our society?

More Statistics

Sprinkler systems are estimated to perform with a reliability of 95 to 99 percent when activated. A report by Bill Koffel, Koffel Associates, argues that the reliability rate is somewhere closer to 86% to 96%. Compartmentation statistics shows a track record with reliability between 80 - 99%. (Bukowski, Budnick, Schemel, 1999 SFPE ICFRE3 Third Proceedings.) In both industries, compartmentation and sprinklers have impressive fire and life safety statistics.

However, Richard Bukowski of the of the U.S.'s NIST, recently said at the Chicago Council on High Rise Buildings Fire Safety Seminar, "There is a call for risk informed regulation for extreme events, and layers of protection and redundancy / robustness in construction ... are needed in today's post 9/11 world." Additionally, World Trade Center reports mention that regulators should consider redundancy for more than just high rise occupancies as well.

In construction, the process of creating the built environment, the site of assembly is not a manufacturer's warm, heated / air-conditioned, humidified area. It's outside, sometimes exposed to the vari-

ability in weather that happens in each day, every season of the year. Plus, occupancy can change necessitating changes to

Would a building constructed under the new codes withstand the 5-1/2 hours plus fire experienced at the LaSalle Bank Building in Chicago...if the sprinkler system doesn't respond, water turned off, is out of service for maintenance, disabled by vandals, terrorists, or obstructed by building occupants? What if compartmentation fails too as doors may have been left open, a damper not operating, or firestopping misapplied? None of the fire and life safety systems can claim 100% infallibility.

The LaSalle Bank Building burned 5-1/2 hours unchecked by sprinkler systems before spreading to the next floor...thanks to vertical floor compartmentation protection.

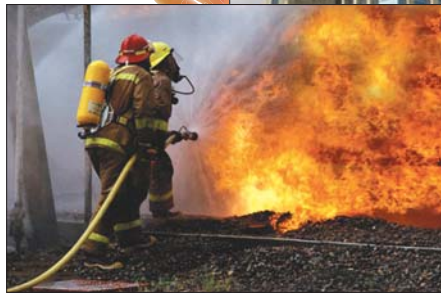
Without effective compartmentation and / or sprinklers, fires can move fast if not checked by firefighters or sprinkler systems, creating risks that may not have existed before. The Windsor Tower Building Fire, in Madrid, Spain, was a total loss in February 2005 because compartmentation was not completed at the perimeter of the structure, nor was a sprinkler system installed.

Certainly construction types are different in each building. However, even through extreme fire attack, the LaSalle Bank Building supported several floors above it, protecting



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people and property. People waiting in the compartmented structure stayed put safely until rescued by fire fighting personnel... some for an hour. And, smoke management kept egress areas passable as well.

What to do?

Corridors may no longer be fire or smoke resistance rated to protect occupants in many types of buildings under the new code. This, plus the hundreds of other trade offs where sprinkler systems have displaced effective compartmentation and structural protection may change the dynamics of how buildings perform in the future under fire attack.

The general public needs to understand the new dynamics in buildings and respond accordingly. Alarm, detection, sprinkler and compartmentation systems need to be maintained in working order ready to activate when needed. Fire drills with simultaneous evacuation of a wide range of occupancies should be practiced more often. Education about building protection fire and life safety features plus their role in personal safety should be part of education for both young and old alike. Building occupants should understand their role in understanding the structure, where routes out of the building are, and how they can safely get out using the protected compartmentation system to keep them safe along the way, with sprinkler controlling the fire behind the wall or under the floor.

There have been statements made that there are huge savings eliminating compartmentation and structural protection. However, there are big losses that come later in flexibility of use for the area that could render the remaining fire protection feature below code and safety requirements.

There are economies in building compartmentation into a structure upon initial construction. Drywall contractors are hanging wallboard on the project already. How much more does it take to install the drywall to the bottom of the next floor? Isn't this best practice for security anyway? Swinging and rolling fire doors, fire and smoke dampers, and firestopping is installed also. If the labor is already onsite, then the only add is labor, a marginal cost to when compared to installing these systems later when services and people occupy the structure.

Building occupants expect that buildings are completely safe to enter, occupy and exit quickly if needed. Too much optimizing can cause life safety risks as we push the envelope of material technology's limits to remain competitive with our building costs globally.

Whether its introducing quality programs to the industry, or promoting a more "balanced approach" to fire and life safety, there must be thought given to "optimization" issues. Optimizing life safety systems, to some degree, may be needed to keep our buildings competitive in the world market.

However, being too aggressive may compromise fire and life safety. Which building - school, office, high rise, hospital, hotel - would you rather be resting in, the highly optimized for profit and competitiveness, or something with a bit more "margin for error" built in should something go really wrong when you or loved ones are inside? 🔥

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Life Safety Digest 2006 Industry Calendar

June 4 to 6

NFPA World Safety Conference & Expo, Orlando, Fla.

June 8 to 10

American Institute of Architects National Convention and Design Expo, Los Angeles

June 24 to 27

BOMA North American Commercial Real Estate Congress and the Office Building Show, Dallas

June 27 to 28

Alliance for Fire and Smoke Containment & Control Annual Meeting, St. Charles, Ill.

Aug. 10 to 13

National Association of State Fire Marshals, Washington, D.C.

Sept. 7 to 8

ICC CTC Meetings

Sept. 11 to 16

Door and Hardware Institute DHI Conference & Exposition, San Diego

Sept. 14 to 16

Fire and Rescue International (IAFC), Dallas

Sept. 17 to 30

ICC Annual Conference & Code Development Hearings, Lake Buena Vista, Fla.

Sept. 24 to 26

IAPMO Annual Conference, Chicago

Oct. 8 to 12

SMACNA Annual Convention, Phoenix

Oct. 15 to 20

Society of Fire Protection Engineers Professional Development Conference and Exposition, Ellicott City, Md.

Oct. 19 to 20

ICC CTC Meetings

Nov. 8 to 10

FCIA Firestop Industry Conference & Trade Show, Charleston, S.C.

Dec. 12 to 13

ICC CTC Meetings



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Industry News

Code Corner

New Committee of Building and Fire Code Officials Formed

A committee has been formed to encourage building and fire code officials to work closely on the Model National Codes.

Co-chaired by New York State Fire Administrator James A. Burns and New Jersey's Director of Building Code Enforcement William Connolly, the Safe Building Coordinating Committee will consist of three building code officials, three fire code officials and three independent scientific experts who will be announced soon. Both the National Fire Protection Association and International Codes Council will be offered seats on the committee.

The new Committee will serve purposes that include:

- Encourage greater cooperation among building and fire code enforcers.
- Conduct joint assessments of all code proposals for purposes of providing guidance as proposals move forward.
- Coordinate floor statements at code hearings and comments submitted for the public record.
- Help building and fire code enforcement officials secure resources to participate in the process.
- Help clarify unresolved questions about specific code proposals.
- Help facilitate discussions with the industry on what constitutes

adequate levels of safety.

A committee has been formed by NASFM. For more information, contact Allison Crowley of the National Association of State Fire Marshals at 202-737-1226 or at allison@firemarshals.org.

Balanced Fire Protection Design Discussed

Significant discussion continues to take place regarding the issue of a "balanced design" for fire protection.

The International Code Council's Code Technology Committee (CTC) and Terrorism Resistant Buildings (TRB) met in Rosemont, Ill., the week of March 8 for a two day conference with several industries represented in this "Balanced Fire Protection" research discussion for buildings throughout the U.S.

Attendees included representatives from The American Forest and Paper Association, Schulte & Associates, National Fire Sprinkler Association, Door and Hardware Institute, Portland Cement Association, Firestop Contractors International Association, Fireproofing Manufacturers, code officials, National Association of State Fire Marshals, National Institute of Standards and Technology, Underwriters Laboratories, Alliance for Fire and Smoke Containment and Control, several state agencies and fire protection engineering firms.

Chaired by Paul Hielstedt, former president of Building Officials and Code Administrators International (BOCA) and now of Heilstedt &

Associates, the ICC CTC heard proposals from the National Institute for Standards and Technology (NIST) and others about balanced fire protection and the multi million dollar World Trade Center "NIST Reports."

The charge of the ICC CTC group researching balanced fire protection, as directed by ICC Board of Directors, is: "The study of balanced fire protection includes an assessment of the appropriate amount of active (i.e., fire sprinkler) versus passive (i.e., rated compartments and structural fire protection) requirements to be required by the code. In this regard, many proposals have been considered in past cycles to revise the height and area provisions as well as the level of fire sprinkler trade-offs. The scope of this activity would be an investigation of the requirements in the code and the establishment of a clearly defined scope of work for the CTC to consider. Depending on the scope of work, the effort may result in a long term activity."

Since the NIST reports focused heavily on structural steel fireproofing, many code change discussions were heard about increasing the density and bond strength of applied cementitious type fireproofing to structural steel. Also, increases in fireproofing inspection frequencies have been recommended to validate the in-place quality of the

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Industry News

Code Corner

installed fireproofing.

FCIA testified that in addition to inspection, qualified contractors should be used to maximize installed system value, productivity and quality. Contractor quality programs coupled with inspection means the process can be evaluated, adjusted for efficiency and bring value to the building owner.

During the discussions, it seemed that there was some frustration by members of the committee.

Carl Baldassarra, co-chair of the CTC, asked for credible data to support changes that NIST and others brought forward.

The TRB Committee Chair Bill Connolly commented sternly, "Less than 2.5 years after the Pearl Harbor Attacks brought us into World War II, thousands of warships and planes were built and men mobilized into Normandy. With almost 5 years behind us since Sept. 11, we've not really done anything yet."

During discussion at the TRB portions of the meeting, blast resistance was explored with a quantitative value of 2psi resistance assigned. The Door and Hardware Institute volunteered to supply information regarding the blast resistance of doors for the group to validate the resistance of the wall assembly, either concrete block or gypsum drywall. Additionally, photo luminescent-lit exit paths were explored as power outages are common when emer-

gencies occur.

To view the reports, visit <http://wtc.nist.gov/>. The discussions continue with more meetings scheduled. See the Industry Calendar for dates. Also, visit <http://www.iccsafe.org/cs/cc/ctc/index.html> for specific meeting schedules and topics of discussion.

FCIA's Compartmentation Symposium

Firestop Contractors International Association's Compartmentation Symposium was a big Success at The 50th Anniversary CSI Show. CSI, the 18,000 Member Construction Specifications Institute, has a long history of providing specifiers great educational programs.

At the CSI 2006 Show, the "FCIA Compartmentation Symposium" was presented to a standing room only crowd. There were seven speakers, featuring Ed Glock, Masonry Institute; Nestor Sanchez, USG for the Gypsum Association; Eli Howard, Sheet Metal and Contractors National Association (SMACNA); John Geniesse, Door and Hardware Institute; Steve Hahn, Lawrence Roll Up Doors, representing the American Rolling Door Institute; Bill O'Keeffe, Safti-First; and Bill McHugh, FCIA.

FCIA's Compartmentation Symposium brought together the pieces that make effective compartmentation work in buildings. Each pre-

sender spoke about important points that make his or her technology work in compartmentation.

The compartmentation team received several compliments about the unique program, with requests for repeat performances in other parts of the U.S. and Canada.

To have a program presented in your area at a CSI, AIA, APPA, DHI or other association meeting, contact FCIA at info@fcia.org. We can't wait to bring our group of specialists to educate your organization about compartmentation!

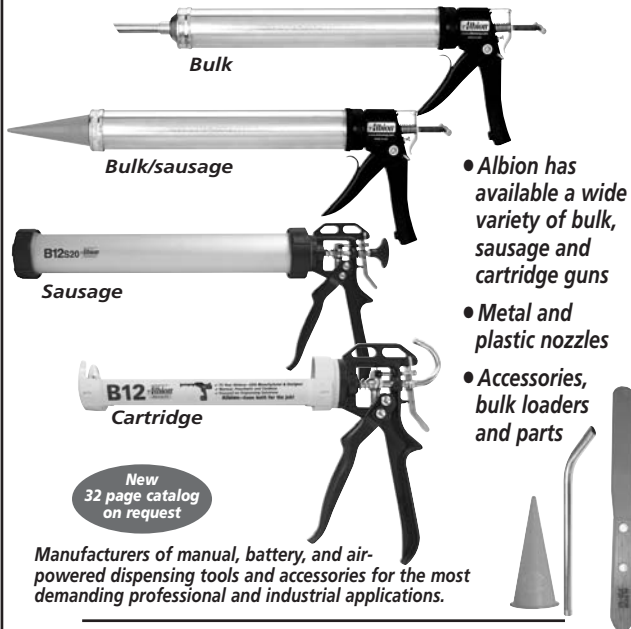
More from the CSI Show

Firestop Contractors International Association members Mike Pautsch of Superl, Inc. and Jim Shiver of Thermafiber Inc. presented "Perimeter Fire Containment Seminar" to specifiers at the CSI Convention.

Another FCIA member, John Hurley of Specified Technologies Inc., brought "Barrier Integrity Management" to the attendees at his presentation. Safti-First President Bill O'Keeffe updated the group on "Understanding the Many Choices in Fire Rated Glass." National Gypsum's program, "Understanding the UL Directory," rounded out the education programs.

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Code Corner

and industry members.

The FCIA was an education sponsor of CSI Show. As a result, the FCIA moderated five sessions on compartmentation ...in addition to being recognized at the keynote opening session, awards gala and in handouts to thousands of attendees. The FCIA is pleased to have a very productive relationship with CSI providing education for professional and industry members.

ICC Code Changes Submitted

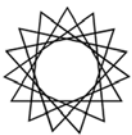
Compartmentation limits the spread of fire and smoke from the room of origin to other parts of

buildings. Firestopping is a vital part of compartmentation, with swinging and rolling doors, hardware, fire and smoke dampers, fire glass and the fire wall or floor working together to protect people, first responders and property.

Compartmentation was the basis for the Firestop Contractors International Association's nine code change proposals for the 2007 code cycle at the International Code Council, ICC. FCIA's submissions focused on revisions to the International Building Code, Chapter 7, and the International Fire Code, Chapter 7, Fire Resistive Construction.

The Door and Hardware Institute, Alliance for Fire and Smoke Containment and Control and International Firestop Council also submitted proposals for code changes.

We understand that the National Association of State Fire Marshals and many others submitted code change proposals. FCIA looks forward to being an active participant in the code development process to bring fire and life safety through compartmentation to the building and construction industry.



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Industry News

Testing & Qualification News



FCIA's Accreditation Committee Chair Aedan Gleeson (from left) meets with UL's John Carlin and Betsy Titus and HILTI's Guy Bradley.



Underwriters Laboratories Inc. conducted its first UL Designated Responsible Individual exams in Montreal in April.

FCIA Members Specified

Firestop Contractors International Association has been made aware that there are architects, engineers and consultants asking for FCIA members in their firestopping specifications.

"We nailed down a large project because we were listed on the FCIA Website," said Tony Gamble of Apex Firestop.

"At Affinity Architecture & Firestopping Consultants, we require FCIA membership of contractors that bid our projects because we know they are committed to a higher level of industry participation, which adds value to our projects," said Rob Hlady, principal.

FM 4991 Gaining Acceptance

Factory Mutual Approvals, a division of FM Global - a large insurance concern - continues to add Approved Contractors to its list.

What started with about 13 in 2001 now has 89 locations nationwide who can offer FM 4991 Approved Firestop Contractors to the industry. FM Approvals continues to conduct FM 4991 Designated Responsible Individual (DRI) Testing and audit inspections of Firestop Contractor Firms for FM 4991 Approval.

Firestop Contractors International Association members have reported that the FM 4991, Standard for the Approval of Firestop Contractors, administered by FM Approvals, has been widely specified by architects and engineers looking for a quantifiable quality standard for firestopping contractor qualifications. Like an ISO 9000 Quality Program for manufacturers, FM 4991 is a process to audit the operations of a firestop contractor. We understand that more compartmentation industries may be evaluating this process for their own industries.

New UL Contractor Quality Program

Underwriters Laboratories, Inc. (UL) conducted its first UL Designated Responsible Individual (DRI) exams at the FCIA Education and Committee Action Conference, April 28 in Montreal. Over thirty people sat for the first UL DRI Exam, and will schedule audits for their firms sometime in the next 90 days. The DRI Exam is based on FCIA's Firestop Industry Manual of Practice which is written generically enough to cover products, systems and practices worldwide. There was an additional test section written for the Canada FCIA Members that addressed local requirements.

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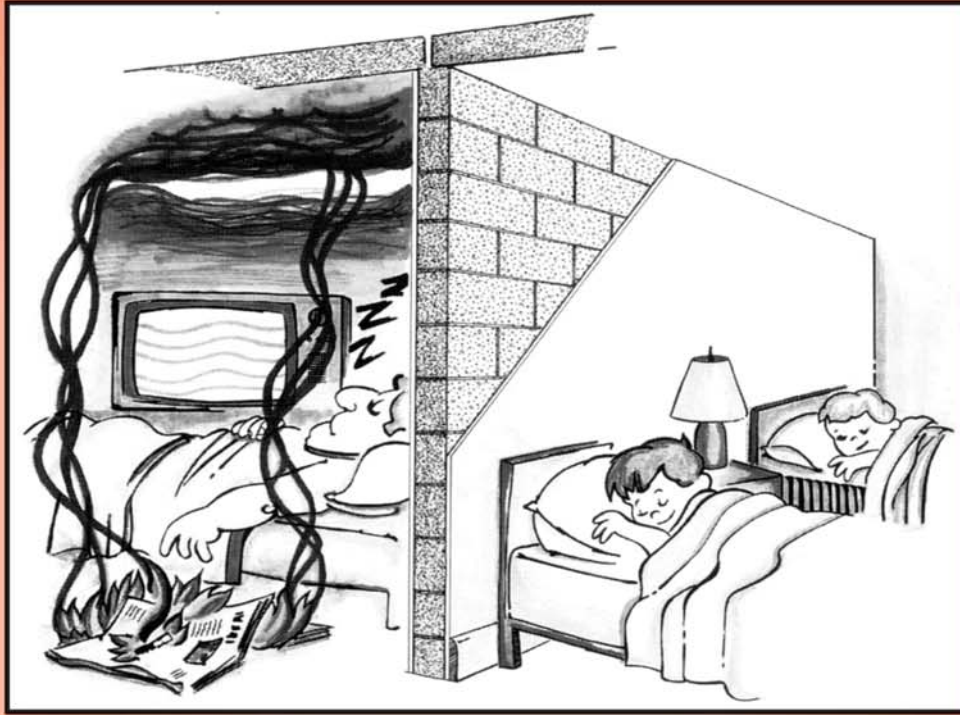


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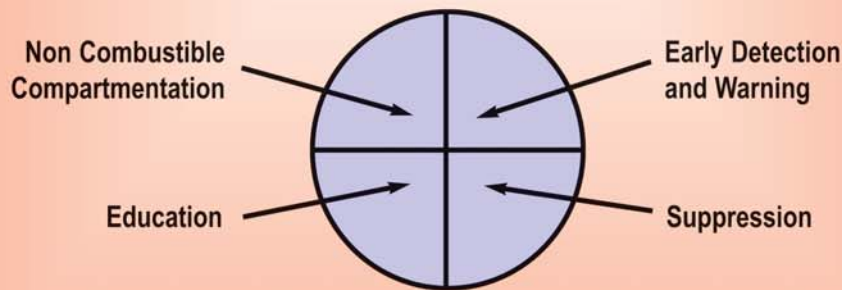


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