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The Magazine of Effective Compartmentation

Life Safety **DIGEST**

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Student Housing

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Georgia State

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Door Closer



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Editor's Message

Educational occupancies house our greatest resource, students. Appropriate design, security, fire and life safety are huge parts of creating an environment conducive to learning.

In this issue, FCIA's Randy Bosscawen wrote about the Our Lady of the Angels fire in Chicago. Although the tragedy took place 50 years ago, the event stimulates debate about fire protection, fire drills, and occupant behavior even today. Georgia State University's Marty Waterfill speaks out about fire door inspection, while fire-resistant glazing systems and firestopping quality programs bring new strategies for construction quality and safety for occupants. Eric Ciccone

points out problems in higher education dormitory fire behavior.

It's amazing that fire-resistance-rated corridors are not required in education occupancy school construction. Certainly concerns about child safety by classroom doors that must be open to monitor classroom activity, protecting students and teachers are valid arguments. However, how can the corridor be a haven of safety for egress, if it's not fire-resistance-rated?

FCIA believes that all types of fire protection - alarms and detection, fire- and smoke-resistance-rated horizontal and wall assemblies and suppression systems, plus occupant education - are needed to keep us safe, wherever we are, when an emergency event strikes.

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There's a big difference in fuel loads, left dorm room to right.

By Eric Ciccone

There is no silver bullet when it comes to fire protection, regardless of building and occupancy type. The old cliché about putting all your eggs in one basket is never more important than when it comes to boarding school, college and university student life safety.

All fire protection systems can fail. The chances of failure are even higher with student occupants because they are known to disable the fire protection systems that boarding schools, colleges and universities rely on for fire and life safety.

The NFPA reports that the only occupancy group that has experienced an increase in fires between 1980 and 2005 is the student occupancy group. According to the American Society of Safety

Engineers (ASSE), there are approximately 1,700 fires per year in student housing. It was noted in these statistics that smoke alarms can fail 21% of the time. Even when smoke detection and alarms work, they are often ignored by students due to the numerous false alarms experienced in this occupancy.

Perhaps the most disturbing news is that 33% of the fires are the result of student arson. Psychologists maintain that an arsonist usually wants to ensure the success of the fire and that can be achieved by disabling the fire protections systems.

It is immensely important to reduce the student occupants risk by incorporating multiple fire protection systems and occupant education tactics. This can be achieved through using all types of fire protection, from effective fire-resistance-rated and smoke-resistant compartmentation

systems, detection and alarm systems, sprinklers, and education. Each component is an extremely important front line tool for fire and life safety. However, compartmenting buildings to protect against fire spread can help ensure safety to occupants. This is especially true in a high-risk occupancy, like students. Compartmentation systems include the fire-resistance-rated wall, floor, firestopping, fire dampers, fire-resistance-rated glazing, swinging and rolling fire doors, and high performance fire-resistant coatings. The fire-resistant coatings can slow the flame spread within a room and increase the fire endurance of the structure. All these methods buy precious time for the student to evacuate under fire conditions.

The statistics can be sobering and the stories behind them can be terrifying. For instance, Boston University recently lost two students in an apartment fire. We have grown almost to expect this horrible news, but, beyond the headlines is the fact that the apartment building the students were occupying had been experiencing a prolonged power outage that drained the battery backup on the smoke alarm system. A sampling of headlines from the Collegian newspaper at the University of Massachusetts Amherst mirrors the ASSE statistics. For instance, the Collegian News reports that in a one-year period, there were 152 fire calls to the university. Of the 152 calls, over 100 were actual fires. That is a lot of fires,

but it is also a lot of false alarms contributing to student “alarm apathy.”

Another Collegian article reported that a student was expelled for lighting a fire in one of their largest dormitories. Twenty-two students were cited for remaining in their rooms during the actual fire. Symptomatic of the alarm apathy, the students thought it was another false alarm, so they stayed put doing whatever they were doing. On another occasion, an early morning alarm resulted when a student intentionally broke a water supply pipe, disabling the sprinkler system.

These problems are by no means unique to the University of Massachusetts Amherst. While these types of incidents make headlines at the university, around the globe many infractions never get reported because they are considered common and minor. For example, covering up smoke detectors so students can smoke in rooms or overloading the power supply in dorm rooms can cause a fire.

Headlines help back up the statistics and accentuate the need to improve all types of fire protection in dormitories. With some deeper research, we can understand just how high the student fire risk is by listening to college fire safety officers who are on the front lines.

Rich Lemoine, health & safety director at University of Lowell, in Lowell, Mass., said, “The difference between a high school student and a college student is.....90 days.” These are just kids away from home for the first time and they just may not know how to use a toaster oven properly, let alone be responsible while they may be intoxicated.

Two college fire safety officers who are founding board members of the Center for Campus Fire Safety (<http://www.campusfiresafety.org>)

preach the age old “occupant education” to help improve student fire safety through education. Mike Haligan, of the University of Utah, and Mike Swain, of the University of Massachusetts at Amherst, are fire safety officers for their organizations. They hold annual Campus Fire Safety Forums around the U.S. to help raise awareness about the problems with student housing and share best practice solutions. “Students who light fires often view themselves as pranksters. They are not pranksters. They are arsonists. It’s important to educate students about this.” The deadly Seton Hall fire that killed three students was started by a so called “student prankster,” stated Halligan and Swain.

Not only has behavior been a factor in campus fires, the fuel load in dorm rooms has changed. Deputy Paul Calderwood, who consults and lectures on student fire safety with over 30 years experience as a fire safety officer at Tufts University, points out that the synthetic plastics and foam-filled dorm rooms of today add a tremendous amount of fuel to a fire. “Thirty-five years ago, the fuel burn load in a room was probably 8,000 BTUs (British Thermal Units) per pound,” he said. “Now, with computers, stereos, televisions and man-made fabrics and foam.... that fuel load is up to 18,000 to 22,000 BTUs per pound. The result is a hotter and faster-moving fire that can overpower sprinklers and generate huge quantities of black, acrid smoke that could obscure exits and drop people in the building quickly after just a few breaths. From a firefighter’s standpoint, that means I have very little time between ignition, finding the fire, getting (the occupants) out and getting us in to put (the fire) out.”

Colleges have annual paint main-



Fire officials inspect dorm room construction

tenance programs that can be a curse or a blessing. A curse because the yearly ritual involves loading up fire-resistance-rated walls and ceilings with layer upon layer of paint that can add fuel to a fire. Depending on the structure age, a dorm room could have 40 layers of paint on the walls. To make matters worse there could be lead paint hiding under the more recent top coats.

But there is a silver lining. The yearly paint program could be easily converted into a passive fire protection program by replacing the paint with a new second generation intumescent paint system. By using these coating systems and assuring fire doors, fire dampers, and firestop systems are installed correctly, the fire will be denied fuel load. Hopefully this will slow fire spread, and maintain or increase the fire endurance of the walls and ceilings.

An ad-hoc group of Boston area college fire safety officers tested new technology in fire-resistant paint at the Boston Fire Training facility. Their effort focused on the efficacy of using new fire-resistant paint technology to buy time for students to evacuate under fire conditions and balance out the mechanical fire protection with an “invisible” system that was not sub-



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ject to mechanical failure.

Their case study culminated into a full scale burn of two dormitory rooms with combustible wood furniture donated by Northeastern University. Two rooms were built identical in every way except one room had a thin coating of a new fire-resistant paint on the walls and penetrations were sealed with the proper firestopping systems to create a fire-resistant compartment with the goals of slowing flame spread in and beyond the room of origin, limiting smoke propagation, and keeping the rooms relatively cool delaying or preventing flashover. The group's testing showed that these goals can be met and exceeded. The successful "real world" dorm room fire test can be viewed on at www.DormRoomFire.com or on

YouTube by typing in "Dorm Room Fire."

In light of these truths, student safety must include education of occupants; increased inspection of fire protection systems including detection and alarms, sprinklers and fire; and smoke protection features such as fire dampers, fire rated glazing, firestopping and fire rated doors and hardware in dormitories, fraternities, and sororities to help protect lives and a campus' most valuable assets...it's students. 🔥

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Sample Dorm room before fire



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School Life Safety: A Step Backward

By Randall Bosscawen

This is a “true story” of a horrifying event that occurred in a “legally safe” kindergarten through eighth grade parochial school.

Chicago’s Our Lady of the Angels School was a two-story building constructed prior to 1949’s building codes. Built prior to requirements for fire protection devices, fire doors and fully enclosed stairways, the structure fell under the 1905 codes that did not require these features. Upgrades were not mandated. Thus, this structure was considered “legally safe”.

The school contained six classrooms on the second floor with stairways on each end, and one fire escape. There was an open pipe shaft running from the basement level of a stairwell up to the attic space. Stairwell fire doors were located on the basement and first floor levels, and not on the second floor stairwell level.

Around 2:30 p.m. Dec. 1, 1958, a smoldering container of refuse located in the basement level of one of the stairwells erupted into flames. The heavy black smoke quickly bypassed the first floor corridor due to the presence of the fire doors, and began pouring up the stairwell to the second floor corridor. At the same time, this incapacitating smoke was filling the exit corridors. Then, flames erupted in the pipe chase, traveling to the attic and creating further fire spread. Due to the fast fire spread, this was truly a time when seconds meant the difference in survival.

As we know, emergencies, things can go wrong. One of the first teachers who exited the building with her students switched the fire alarm lever, which failed to activate the alarm.

She then escorted her class to the church next door. After the children were safe, she returned and switched the alarm again. This time it activated. However, valuable time was lost. It had been close to eight minutes since she initially noticed smoke in the building, and initiated her escape with the children in her class.

Even when other teachers became aware of smoke filling the second floor corridor, they remained in their classrooms. The rule at Our Lady of Angels was to never leave the building until the fire alarm sounded.

Other student evacuation delays occurred when the fire department was given the wrong address. The first vehicle on site, an engine truck, had inadequate ladder lengths that did not reach the second floor windows because a chained six-foot-tall iron fence blocked access to one side of the building.

During these evacuation and rescue delays, children were dying. Little children who had always looked at school as a safe, spiritual place, found themselves suddenly trapped in classrooms by the smoke filled corridor.

Shortly thereafter, these children and teachers were overwhelmed by smoke as the non-fire resistance-rated corridor door transoms above the doors burst open because of the intense heat. Then, flames rushed into their classrooms.

As a result, children were jumping out of the windows. Some were on fire, some landed on their friends who had previously jumped from the windows. Many children sustained broken ankles, hips, legs, necks and fractured skulls as they escaped flames and flew out the windows. Fathers

with arms outstretched begged their children to jump to safety, only to see flames devour them.

Ninety-two children and three nuns perished, and 90 students and three nuns were injured. One can only speculate how many lives could have been saved if only a fire door had been on the second floor stairwell, or if the corridor walls been constructed as a fire barrier, with fire-resistance-rated doors and no open transoms. As the fire raged, seconds were virtually the difference between life and death.

Often it takes tragedy for building codes to react and prevent disasters such as Our Lady of the Angels. The lessons learned from Our Lady of the Angels fire led to revisions in the building codes covering educational occupancies, including:

- Fire doors at stairwells
- Corridor walls constructed as one-hour fire barriers
- Automatic sprinkler systems
- Fire alarms connected directly to the fire department

This is my second “true story.” It seems lessons learned from the tragedy were soon forgotten. Current International Building Codes (IBC) do not require one-hour fire resistance rated fire barrier walls and fire doors in stairwells and corridors, but do have sprinklers.

As a society, are we putting all our trust in mechanical and electrical systems such as sprinklers and detection and alarms? Remember that the malfunctioning alarm system at Our Lady of Angels cost eight valuable minutes. Did we not learn that enclosed stairwells and rated corridors provide additional time for evacuation and rescue?

After researching the Our Lady of Angels fire, I pulled out plans for a school project I am currently working on in order to visualize what dangers children might be exposed to under

current codes. This new school has a large open rotunda in the center with open stairwells on opposite ends. The second floor contains 19 classrooms, restrooms, and numerous storage rooms with non-fire-rated corridors.

Knowing that smoke can travel faster than you can run, why not provide our children fire-resistance rated barrier walls with fire doors and hardware, fire-resistance-rated glazing, firestopping and fire dampers for a true safe environment instead of settling for a "legally safe" environment?


In the interest of life safety, should a rotunda in a school be reconsidered? How much weight should we put on fire door costs at stairwells compared to the life safety benefits? The corridor walls run from floor to deck on this project, meaning the walls could become fire-resistance rated for mini-

mal cost. What would the additional cost be to make corridors fire-resistance-rated compared to the protection provided? Incrementally, not much.

To protect future generations, we must remember the past. Things go wrong. What happens if the sprinkler system malfunctions, the alarm fails to activate, the fire department is delayed or numerous false alarms cause occupant complacency, delaying the exiting process?

We are fooling ourselves if we think all mechanical and electrical systems are in working order 100% of the time. Architects, school administrators, Parent Teacher Associations (PTAs) and the general public need to be educated about the risk of subjecting our children to a "legally safe" building compliant with current building codes. We should insist that codes reinstate

previous passive life safety protection in corridors, with fire barriers, fire doors, fire dampers, and firestopping. At the least, design professionals, contractors and others should inform local communities that they have the right to insist on additional life safety features over and above what the building code requires.

Have we taken a great step backwards in protecting our children? I hope we never encounter "true story number three." 

Reference

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Getting Ahead of the Curve on Upcoming Fire Door Inspections

By Marty Waterfill

Mandated fire door inspections are just around the corner. The latest requirements of NFPA 80-2007, now referenced in the 2009 International Building and Fire Code, requires annual inspection of fire doors, once adopted by a jurisdiction. Rather than wait until inspections become mandatory, Georgia State University decided to get a head start on what would be a big project for any institution.

Georgia State University (GSU) was founded in 1913 and is located in the heart of downtown Atlanta. Today it serves more than 27,000 undergraduate and graduate students. Because of its location, the university has grown by taking over some existing buildings and has continuously built new facilities to accommodate growth. Other buildings were built by GSU many years ago. Through the years, various repairs and renovations have been made. Three or four years ago, the university completed a fire door project that upgraded several hundred doors.

At a Door & Hardware Institute meeting in Atlanta, a speaker outlined the new code provisions and the requirement for annual inspection of fire doors. These requirements were adopted and published by the National Fire Protection Association, in the form of NFPA 80-2007. Once adopted by a jurisdiction, these requirements become binding and enforceable. This is likely to occur by 2010.

Following the meeting, I thought about all the fire doors in our 60 major downtown buildings. The buildings hold a lot of students, with up to 100 people in some classrooms. We take our responsibility for the stu-

dents, faculty, staff and visitors seriously. With this responsibility and the certainty of the inspection requirement, we decided to move ahead as soon as possible instead of waiting for

inspections to become mandatory. There is an ongoing funding allocation available to us to meet code regulations, and we had been planning to fix some more doors. With the knowledge

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of the code changes, we realized there was a provision that allowed us to inspect only one-third of the doors each year if we kept good records that proved we had maintained the fire doors properly. This creates a three-year inspection cycle, as long as you keep records of the work done on each door and don't do anything that brings it out of compliance.

We already had a good start on a records system, since all our doors are identified and numbered in the Archibus system, a facilities management software program at GSU. While not yet fully populated with the needed door data, it and our Autocad® program contain details on the size and construction of each door, its hardware, any windows or special configurations and related information.

With this base, I realized we could segregate the fire door listings and bring them up to date, using the form indicated by the code to collect information. This is a work in progress. When completed, it will allow the fire marshal or Authority Having Jurisdiction (AHJ) to determine the condition of each door and verify that it was properly inspected by a certified individual, along with any corrective actions that were taken.


As a first step toward this goal, we had a certified inspector begin inspecting the doors and recording details on their condition. We first concentrated on those of greatest importance in case of an actual fire. These include stairwell doors and main lobby doors, for example. The inspector and his team inspected about 170 doors in five buildings. They performed operational tests, took photos, checked the labels, noted the window size if any, recorded the kind of hinges and other hardware, and noted the condition of the door and its hardware. So we could transfer this information to our system, they put it on a disc for electronic filing.

In order to increase the awareness among our maintenance people of the importance of following fire door codes, they have been attending new programs about fire regulations. Recently we attended a fire marshal's training program. It was an eye opener for them as well as for our people, because AHJ's got to see the other side of the picture. I think it helped get the message to everyone that this fire door inspection program and fire safety is a good thing.

Back on campus, we looked at ways to increase ours and contractors' knowledge of codes. Of course, any repairs or renovations will be noted in our records so they are available to us and the inspectors when the code goes into effect.

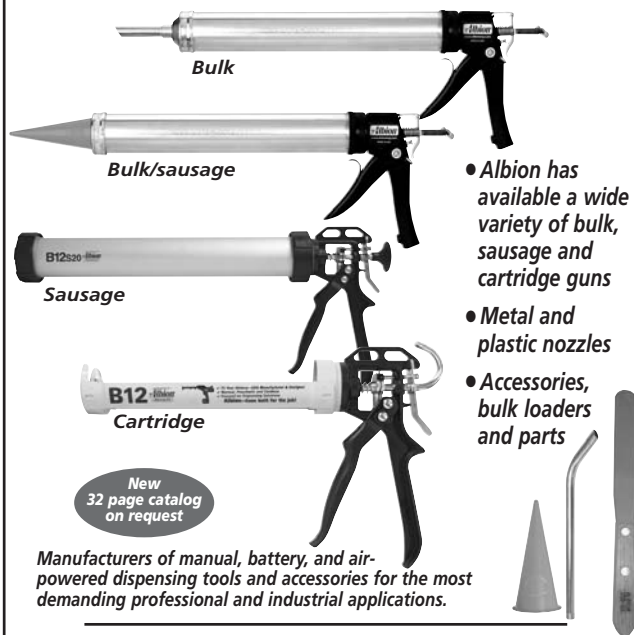
Since we met with the fire marshals, our maintenance people have a new understanding of the importance of following fire door codes when they adjust, repair or install replacement hardware.

Just as important, we have created a record-keeping system that will help us track our fire doors beyond the scope of any one person. The ongoing records will be expanded as we inspect more doors and keep up-to-date with repairs and renovations. This will allow the fire marshal or AHJ to look at the records, determine the rating and hardware for a specific door, as well as understand the work that was done on it.

We expect the system to save a lot of work in the long run. Once we record the information on a door, including the records of inspection and work done to it, we can better monitor doors on a regular basis. This plan is workable, even for a smaller facility, because the owner would still only have to inspect one-third of the doors each year if proper records are kept. It not only saves the cost of inspecting all the doors every year, but it also ensures that they are all functioning the way they are supposed to and protecting both the buildings and their occupants. 

Marty Waterfill is a facilities engineer at Georgia State University in Atlanta.

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Glazing for Life Safety in Educational Facilities

By Jeff Razwick

The U.S. Fire Administration reports that while fire deaths are rare in primary and secondary schools, the injury rate is approximately 50% higher than the average for all non-residential structures (22.0 injuries per 1,000 fires in schools versus 14.4 for other buildings) (See Note1). Incendiary or suspicious fires predominate, accounting for 37% of all school structure fires - and 52% of fires in middle and high schools.

At the college level, the National Fire Protection Association (NFPA) reports that dormitory fires increased 3% from 1980 to 2005, despite a 52% decrease in structure fires of all types during the same period (See Note 2). Cooking equipment is the leading cause of such fires, responsible for 72% of incidents from 2002 to 2005.

Educational facilities present several potential challenges for addressing life safety: frequent false alarms, older buildings without adequate sprinkler protection, and large numbers of people needing evacuation.

Effective Building Compartmentation plays a key role in protecting students and staff from fire. In refurbishment of older buildings, as well as new construction, awareness of the role of fire-rated glass and frames, as well as the proper applications for various types of glazing, is an important part of overall building compartmentation.

Code Issues

A key code issue related to fire-rated glazing is local jurisdictions' ongoing adoption of the 2006 International Building Code (IBC), which eliminates the use of traditional polished wired glass in hazardous locations. Wired glass had been a staple of fire protection in schools for decades due to its affordability and ready availability.

While such glass is effective at blocking the spread of flames and smoke, it is relatively low strength and therefore susceptible to breakage in the course of everyday use - such as is common in busy school hallways and classrooms where students may bump into it. Because of the potential for injury from broken wired-glass, the IBC now prohibits it in typical "safety glazing" areas such as doors, sidelites, windows near the floor, and other areas at risk for impact. Fire-rated glass in these applications must now meet impact safety ratings of the Consumer Product Safety Commission's (CPSC) Safety Standard for



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Prior to the 2006 code change, the 2003 IBC restricted wired glass in hazardous locations in schools, athletic facilities and daycares. Now the code extends the restriction to hazardous locations in all building types.

Because wired glass is still prevalent in schools, inspection and maintenance programs should seek to identify and replace such glass used in hazardous locations with impact-resistant fire-rated glazing as soon as practical, or when required by code during building upgrades.

Fire-Rated Glazing Options

In recent years, manufacturers have introduced a wide range of fire-rated glazing products. These advanced materials can meet nearly any design or performance requirement - from aesthetic appeal to impact safety resistance to boosting building security and energy efficiency. New classes of materials, and more sophisticated product make-ups, expand the range of alternatives.

Two notable fire-rated glazing classes are ceramic glass and transparent wall panels.

Ceramic glass

With the look of ordinary window glass, transparent ceramic sheets are becoming the standard for many fire-rated glazing applications historically served by wired



Fire rated glazing wall panels

glass. Depending on the product, and product make-ups, ceramic glass offers fire ratings up to three hours in doors (90 minutes in other applications), high impact safety ratings, sound reduction, and other performance benefits. The material can be beveled, etched or sandblasted without affecting the fire rating. An example product in this category is the FireLite family of materials.

Lamination and surface-applied fire-rated films enable ceramic glass to meet the highest standard of impact safety for glass - CPSC Category II, Safety Standard for Architectural Glazing Materials. Such glazing is able to safely withstand an impact similar to that of a fast moving, full-grown adult.

Ceramic glass can also be incorporated into insulated glass units (IGUs) in conjunction with many types of tempered or float glass, including tinted, low-emissivity, and mirrored products. Such IGUs not only provide fire protection, but can also help with a building's energy efficiency - especial-

ly important for cash-strapped schools and for meeting more stringent energy requirements in codes.

Whether included as part of an IGU or not, the specification of fire-rated glazing should also take into account the fire rating of the framing. To ensure adequate fire protection, the framing should carry a fire rating equivalent to the glazing. Manufacturers now offer a range of fire-rated frames, including narrow profile steel frames, as well as fire-rated hardwood frames.

Transparent wall panels

While fire-rated ceramic glass works well in many applications, other products should be used in instances where it is necessary to protect people and equipment from high heat. Ceramics can withstand the high temperatures of a fire without breaking, but allow radiant and conductive heat to pass through.

For exit corridors, stairwells, and rooms with heat sensitive computer equipment, transparent wall panels may be appropriate. Glazing in this category is tested to the same standards as solid walls, with fire ratings up to two hours. In addition to stopping flames and smoke, such glass firewalls also block heat transfer, similar to a fire-rated masonry wall.

Transparent wall panels can be installed from wall to wall and floor to ceiling, and are also available for doors. Some transparent wall panels utilize older technology with insulated glass units filled with a clear gel that turns to opaque foam during a fire. Other products use a newer technology that incorporates multiple layers of glass with intumescent interlayers. One type of product in this latter class is Pilkington Pyrostop.

Labeling and Inspections

Whichever type of fire-rated glazing is specified, it is important during

inspections to ensure it has passed all testing requirements, and is listed by a trusted third-party agency such as Underwriters Laboratories (UL). Be wary of any material that does not pass all required testing, or of manufacturers who ask for specific product exemptions or approval from the local Authority Having Jurisdiction (AHJ). Such products may be presented as a low-cost replacement for traditional wired glass. However, their inability to meet standard fire testing requirements should raise a red flag.

It is also critical during inspections to ensure that the glazing meets the required fire rating, and is appropriate for the specific building location. Fire-rated glazing labels provide inspectors, at a glance, the fire-rating in minutes (from 20 minutes to three hours), the tests the material has passed, and whether it is suitable for doors, openings or walls. For more information, see "Inspecting Fire Rated Glazing: Clear-Cut Labeling System Helps Ensure Proper Usage," Life Safety Digest, October 2008. 🔥

Jeff Razwick is the vice president of business development for Technical Glass Products (TGP), a Snoqualmie, Wash.-based supplier of fire-rated glass and framing systems, along with specialty architectural glass products. For more information, visit www.fireglass.com or call (800) 426-0279.

Notes

1) "School Fires: Topical Fire Research Series, Volume 4 - Issue 6," U.S. Fire Administration, National Fire Data Center, December 2004.

2) Obtained from nfpa.org Feb. 4, 2008. Fire data for dormitories include those at schools, colleges and universities, as well as fraternity and sorority houses, monasteries, bunkhouses and similar facilities.

Why Schools Need to Learn about Door Closers

By Ryan Rouse

The term “door closer” barely begins to explain the many purposes of these widely used devices. Perhaps “door controller” would be a better term when you consider all the other functions they perform. They are considered the “heart of the opening” because of their role in protecting both people and assets contained on the other side. Here are just a few of the benefits they provide:

- Protecting the components of the entire opening
- Providing safe and easy passage through the door
- Ensuring security for people and assets
- Providing environmental control
- Helping to meet fire and life safety codes

Protecting the Opening

This is one of a closer's main functions, especially in high use/high abuse situations, such as in educational applications. Doors at a school or university encounter abuse from more forceful opening and back-checking by over-energetic youth. Although door openings are one of the most highly used and abused components within any educational facility, they nonetheless must enable smooth traffic flow while maintaining safety, security and the overall facility experience.

Still another factor is the presence of high winds or pressure differentials that require greater closer force to protect exterior doors from severe damage. Heavy-duty concealed or surface-mounted closers offer an extra measure of protection in these applications, but their use must be balanced with

the need to avoid making doors too difficult for people to open. Proper closer adjustment plays an important role in achieving the balance needed in these situations. A back check selector valve, delay function or/and other adjustments make it possible to tailor the different stages of closer operation more closely to the needs of a specific opening.

Some closers incorporate a pressure relief valve to prevent damage to the closer under overload conditions, which may be severe enough to cause cracks in the closer cylinder. Closers with cast-iron cylinders generally will not require pressure relief valves, because the material's innate strength resists cracking which ensure the closer opens and closes smoothly.

Adding an overhead stop will help protect both the closer and the rest of the opening against excessive forces. Also important is proper installation and adjustment of the closer itself.

Protecting Students, Teachers and Staff from the Door

This can include preventing accidents or injuries from a door that closes too quickly, minimizing difficulties that children or frail adults may have in opening the door if the closer force is adjusted too high, and meeting accessibility guidelines for those with disabilities.

Closers that are adjusted too strong to meet ADA guidelines will also be difficult for other people to open. If conditions permit, it may be possible to accommodate ADA compliance by adjusting the closer force to Size 1, but in most cases, power door operators are the best available option to meet these needs. Typically one door in a



Door closers protect people and assets, as well as the door itself.



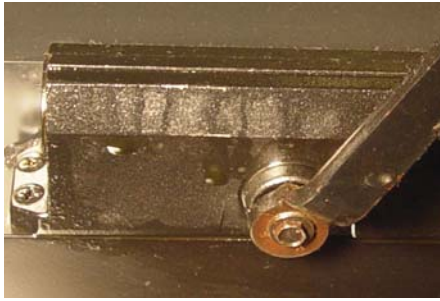
Overhead stop is visible with door open. Used here with concealed closer, it protects the door, hinges and closer from abuse or misuse.

bank of doors may be all that is required. In addition to serving students with disabilities, it can add convenience for teachers and staff loaded down with armloads of files and supplies as well. Properly adjusted conventional closers on all other doors will ensure that they close and latch properly.

In the past, seasonal adjustments were a common attempt to meet these problems, as well as those encountered on exterior doors exposed to temperature extremes. Today, the availability of closers with all-weather fluid has made this ritual unnecessary.

Ensuring Security

Keeping students safe is a critical closer function. No matter how sophisticated or expensive the locks,



Leaking closers may present a risk to personnel and should be replaced.

latches, exit devices, card readers and electronic security systems are, if the door doesn't close properly, latching will be inconsistent and security will be compromised. This can put both students and assets within the facility at risk. More than one school facility director has spent hundreds of thousands of dollars on electronic access control, magnetic locking, and propri-

etary keying systems, only to find that these measures were wasted because the doors would not close all the way to where they could latch and lock.

Security problems like this may arise from improper installation, either in closer mounting and adjustment, or with related hardware. For example, if latch bolt guards are not aligned properly it may create enough friction to prevent the door from latching. To prevent closer adjustment tampering and enhance security, closers can be equipped with metal covers mounted with Torx machine screws. Manufacturers are constantly working to improve performance and enhance closer functions to provide greater security. Some new designs now being developed will self-adjust as their environments or operating conditions change.

Environmental Control

Door closers keep doors closed to maintain the environments inside the school and exclude those outside the facility. It makes little sense to waste money and compromise comfort levels because heated or cooled air is leaking outside when a door doesn't close securely. Likewise, temperature or weather extremes that enter an educational facility through a partially open door can cause damage as well as discomfort. Strong winds can cause damage to uncontrolled doors as well. Inside a building, closers maintain pressure differentials in such areas as stairwells and vestibules.

Leaking closers are both an environmental problem and a potential hazard to students entering and exiting a doorway. The oil inside the closer drips down and can make floors extremely

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slick, not to mention stain clothing and personal belongings of those passing beneath the closer. More importantly, when the oil drains from the cylinder, the closer's ability to control the door is lost. If this were to occur, the door swings freely and could lead to personal injuries as well as costly damage to the door and frame.

Leaks typically are caused by either an o-ring malfunction or cylinder cracks. An o-ring malfunction often results from excessive use or abuse of the opening that can cause the o-ring seal to wear and create a leak point. A second way the pinion seal can malfunction is most commonly found in aluminum closers with steel pistons. The rigid steel piston can wear on the softer aluminum body creating tiny metal contaminants - these abrasive fragments can quickly wear an o-ring creating a potential leak point. Another potential malfunction is cracking in the closer cylinder body. Abusive operation can create excessive internal pressure in the closer, causing the cylinder body to crack.

If leaks occur, several options exist to solve the problem. One is to move to a more durable material structure such as cast iron. Another option may include moving to the next model size in durability. One manufacturer offers a heavy-duty cast iron closer with a 10-year "no leak" guarantee that can help ensure the problem will not recur.

Fire/Life Safety

Here is where we find a classic conflict between two important factors. For door closers, one of the most common problems is with fire barrier doors, particularly for stairwells. As with security, if the door doesn't latch properly, the opening isn't protected. The problem can be especially acute when air conditioning is operating, which creates a large pressure differential between a stairwell and hall-



SENSAGUARD holder/release is designed to function with a closer and incorporates a smoke detector that allows the door to close automatically in emergencies.

way. This has a similar effect as a strong wind and calls for careful closer selection, installation and adjustment to ensure compliance to both the fire codes and ADA.

Fire or smoke barrier doors must remain closed to be effective. However, to allow traffic to flow, they may be held open by electromagnetic holders that are wired into the building's fire alarm system or have internal detection capability. There are a variety of options available that allows one to hold a fire door open and meet fire codes. Options include magnets wired to the central fire panel or integrated closer/detector. One unique option accomplishes the same goal of holding open a fire door without the need to pull wires and provide a power supply. The battery-powered SENSAGUARDTM holder/release smoke detector is designed to allow fire doors to remain open for easy passage, while releasing doors in an emergency through its built in smoke detector. This device, when combined with a door closer, is an attractive choice for retrofit and remodeling applications.

Visual Appeal

Facility aesthetics don't have to be sacrificed. As door closers are selected to provide all of the above functions and also comply with building codes, it doesn't have to be difficult or expensive to achieve an appealing opening. One approach is to use a concealed closer, which is mounted out of sight in the door or frame. These are available in heavy-duty models for high



LCN "No Leak" closer incorporates new V-Shield shielding technology to minimize the problems caused by leaking closers.

use/high abuse applications as well as for fire-rated doors with openings up to 180 degrees.

Manufacturers offer a broad choice of cover designs, including slim-line covers, full covers, designer-series covers and as many as 150 or more different powder coated finishes. Metal covers add security as well as improving appearance, especially when plated. One manufacturer offers a bright metal metallic finish, which is an economic alternative to plating yet offers similar aesthetics. When appearance is a concern, it is advisable to work with a manufacturer that offers full suites of hardware that are coordinated in style and finish, including mortise locks, levers, exit devices and all other visible components.

One way to achieve a consistent appearance where applications vary throughout a facility is to use similar covers but different closer bodies. For example, a school may use heavy-duty closers on doors that are used frequently but less expensive models on janitorial closers. To unify their appearance, it may be possible to use the same cover design on all units. Whenever a standard design doesn't seem to answer the need, it is advisable to check with the manufacturer and see whether there are any alternative solutions. 🔥

Ryan Rouse is Product Manager, LCN Door Controls, for Ingersoll Rand Security Technologies in Carmel, Ind.

Testing & Qualification News

Industry News

FCIA Education and Committee Action Conference, Boston, April 28 - May 1

It's been nine years since FCIA visited Boston. Last time FCIA visited, the new FM 4991 Program was launched, with 52 people taking the first DRI Exams. The 2009 FCIA Education and Committee Action Conference promises FM & UL Testing, reports on new programs from 2008, and new programs for 2009, including FCIA

Committee Meetings, a UL Standards Technical Panel Study Group Meeting, NFPA 80 discussions, a code development report from FCIA's Code Consultant Bill Koffel, and much more. Don't miss out. Visit <http://www.fcia.org>, events pages, for info.



DHI's National Education Session - May 10 - 17 in Lansdowne, VA

With 29 different classes, including DAI 600 Fire and Egress Door Assembly Inspection class, don't miss this education opportunity! For a complete list of course offerings and to register online visit <http://www.dhi.org/INDUSTRY/education/courselistings.php>

Gypsum Association Offers New CEU Course for Free

The Gypsum Association has its third free continuing education unit (CEU) course at <http://www.gypsum.org>. The course, titled Application of Gypsum Panel Products, offers one Health, Safety, and Welfare (HSW) CEU learning unit with the American Institute of Architects (AIA). This course

lays the ground work for the other CEU courses, Understanding the Finishing of Gypsum Panel Products Using GA-216 and GA-214, Recommended Levels of Gypsum Board Finish, and Understanding the GA-600 Fire Resistance Design Manual. Upon successful completion, AIA members will receive applicable CEU credits (1 or 2 hour). Participants also receive a certificate of completion from the Gypsum Association. Questions should be directed to ljones@gypsum.org.



FCIA visits Dubai, UAE –With over 130 AHJ's, architects, firestop contractor, associate and manufacturer members, plus potential members, and the Department of Civil Defence, (DCD) Jabel Ali Free Zone (JAFZ) authorities, FCIA was pleased to have the opportunity to talk March 1 about our common goals...protect people and property.

FCIA introduced the group to the "DIIM", Design, Install, Inspect and Maintain" firestopping and compartmentation concepts. The FM 4991 Standard for the Approval of Firestop Contractors, UL Qualified Firestop Contractor Program, ASTM E 2174 & 2393 Inspection Standards, the value of ASTM E 814 & ASTM E 1966, UL 1479 & UL 2079 tested designs with hose stream testing, ASTM E 2307, and the value of inspection and maintenance during the life cycle of the building for fire and life safety.

Representatives from the DCD and JAFZ spoke about the importance of firestopping in life safety. When we heard this directly from DCD/JAFZ, it was confirmed that we are on the right track.

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Code Corner

Industry News

FCIA attended and testified on several code development proposals in the 2007-2008 development cycle. Here's a few that can affect your business:

The National Association of State Fire Marshals was successful at having an "annual inspection" requirement for all fire protection features, including fire walls, fire dampers, firestopping, fire rated glazing, fire doors and fire floors. The code change in the International Fire Code means it is retroactive to all buildings. It does not state how the inspection takes place, or what should happen after it takes place. This may create opportunities for firestop/containment - compartmentation contractors and inspectors to inspect buildings for building owners and managers who outsource. FCIA testified in support of this code change, as it helps assure that fire and smoke protection features function as intended when exposed to fire.

The International Association of Fire Fighters' Sean DeCrane was successful at getting labels added to fire and smoke barriers identifying them in all occupancies except multifamily residential. Watch the 2009

International Building Code for details, and for a very comprehensive building labeling proposal that gives first responders information about what they might walk into.

The ICC Ad-Hoc Committee on Terrorism Resistant Buildings (TRB) "had a banner year," according to ICC TRB Chair Gary Lewis. One success was the new construction and retroactive installation of photoluminescent markings for stairwells in high rise buildings. This is a new opportunity for FCIA contractors who are well suited to install photoluminescent markings in buildings. Also, elevators are now permitted for egress in emergencies as well. This will be a big retraining for all who have been taught not to use elevators in emergencies.

The Washington Association of Building Officials quantified the "L" Rating required for smoke barriers in buildings. The new requirement states that 5cfm/sf opening area OR 100cfm/100LF of wall area is the new formula acceptable in the International Building Code for 2009. A more technical requirement means a

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knowledgeable contractor and installer must be selected to install these important systems properly.

FCIA successfully changed **Chapter 7's Title** in the International Existing Building Code and International Building Code from "Fire Resistance" to "Fire and Smoke Protection Features." With requirements for smoke control, "L" Rated Firestop Systems, air leakage protected door assemblies, smoke dampers, in Chapter 7 of the IEBC and IBC, the ICC Membership felt the title better reflected what Chapter 7 stands for - fire and smoke protection through fire-resistance-rated and smoke resistant systems. Systems is another word we were successful adding to the IBC.

In requirement **713.4.1, Installation**, "perimeter fire barrier to be installed so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gasses." With this simple passage, responsibility has been shifted from the manufacturer to the installer firm. This will set apart those who install the system correctly from those who do not understand the zero tolerance systems installation protocol.

FCIA had several other code change proposals that were in play last cycle that supported the DIIM Philosophy (Design, Installation, Inspection, Maintenance) that keeps firestopping, fire-resistance-rated and smoke-resistant compartmentation effective for the life of the building. Systems *Designs* submittals for masonry, gypsum walls, from the testing laboratory directories was rejected. The requirement for Certified Contractors by Approved Agencies, such as FM 4991 Approved or UL Qualified, for the *Installation* part of DIIM, was also rejected. And, *Inspection* requirements for firestopping using ASTM E 2174 and ASTM E 2393 were rejected. Good discussion took place with the code development committee about these requirements,

with good support from the building official community, and opposition from the industry. Several building officials commented that they use the ASTM E 2174 & ASTM E 2393 Inspection Standards in their jurisdictions when they feel it's justified by building occupancy and importance. The ASTM E 2174 and ASTM E 2393 standards are out for ballot to make them better suited for the codes. However, building officials report the building type and size would need to be better defined for successful code inclusion. For *Maintenance*, see the NASFM proposal above. The deadline for 2009-2010's Code Development Cycle is April 24. Watch future issues of Life Safety Digest for interesting reports on proposals that affect fire and life safety in buildings.

International Accreditation Services (IAS) just passed a new requirement in AC 291, the Accreditation Criteria (AC) for Firestopping Special Inspection Agencies. In 6.11, it requires the special inspector of firestopping to have passed the FM or UL DRI Examination, in addition to one year experience in firestopping quality control. The significance of this is that there will be educated inspectors reviewing firestopping in the future.

ICC's 2009-2010 Code Cycle is underway, now with a new twist. Instead of a supplement to the 2009 code being published in 2010, and a full code in 2012, a new change at ICC is that only one code development cycle will take place. Code proposals are due for this cycle April 24, with Code Development Committee Meetings in late October early November. Then, two staggered final action hearings take place over the next two years resulting in a new set of International Codes 2012. For details, visit http://www.icc-safe.org/cs/codes/schedule_advisory.html

2009 Industry Calendar

March 24 to 28

AWCI Convention and INTEX Expo, Nashville, Tenn.

April 20 to 25

FDIC, Indianapolis

April 28 to May 1

FCIA Education and Committee Action Conference, Boston

April 30 to May 2

AIA 2009 National Convention & Exposition, San Francisco

May 4 to 6

International Firestop Council, Jacksonville, Fla.

May 20 to 23

Construction Specifications Canada, London, Ontario

June 8 to 11

NFPA World Expo & Annual Convention, Chicago

June 17 to 19

CONSTRUCT2009, CSI Convention, Indianapolis

June 28 to 30

BOMA Annual Conference, Philadelphia

Oct. 24 to 31

ICC Code Development Hearings, Baltimore

Sept. 16 to 25

DHI's 34th Annual Conference & Exposition, Orlando

Nov. 1 to 4

ICC Annual Conference, Baltimore

Nov. 10 to 13

FCIA 10 Year Anniversary & Firestop Industry Conference & Trade Show, TBD

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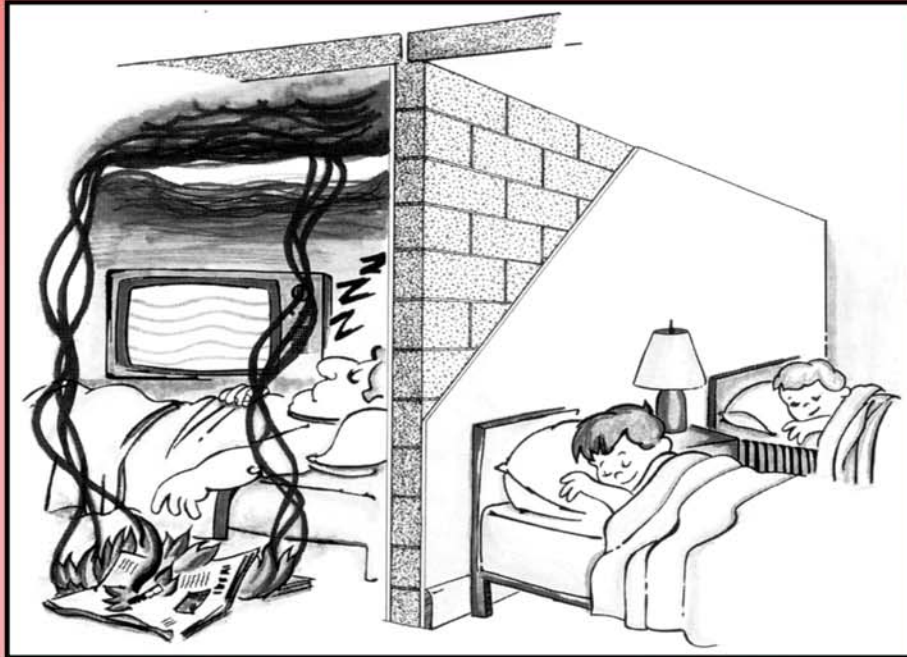
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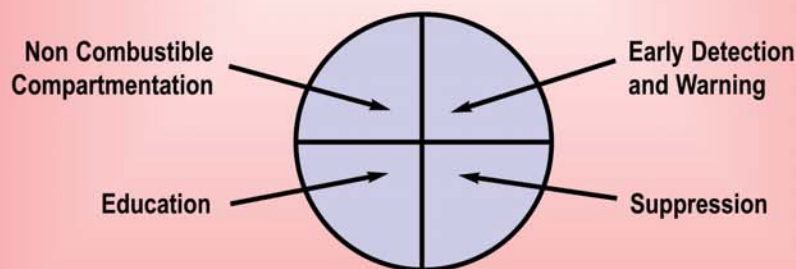


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