The '90s bring with them a raised awareness about fire safety in all kinds of commercial structures from hospitals to skyscrapers. In the '90s, fire safety has become an issue of liability, accountability, and saving lives.

Commercial insulation and drywall applicators are faced with the concern of who is responsible if a fire breaks out and the curtain wall assembly doesn’t hold up to the fire retention specifications set for the job. If fire, smoke and toxic gases are not contained to a specific area, fire can spread from floor to floor through the gap between the slab and exterior wall. The result can be widespread damage and potential loss of life.

"Ever since a fire in the late 1980s engulfed a Los Angeles high-rise where a fiberglass insulated curtain wall system collapsed, there has been a raised consciousness about insulation systems to the point where they’re now seen as critical in the role of saving lives," says Jack Morrison, commercial division vice president of Standard Insulating Company, a major insulation contractor serving the southeast.

Warning Signs

The industry is faced with much more involved and technical insulating jobs, Morrison says. "Today applicators need to have the knowledge and know-how to recognize problems associated with design and engineering, or even hidden design functions."

"A danger lies in the competition of the insulation applicators to land big jobs, as well as building owners, general contractors and architects trying to save money when dealing with tight budgets," adds Ray Usher, president of Minneapolis-based Superl Thermal Systems, Inc., one of the nation’s largest curtain wall insulation contractors.

Morrison agrees, saying the lowest bid for a job, particularly if it’s much lower than the other bids, should send up a red flag. "I’ve known bids to be accepted that are 50% lower than the next highest bid. Insulation applicators who undercut the competition by wide margins can rarely complete the job as specified. The general contractor and insulation applicator must look for ways to bring the job in on plan. Cheaper substitutes which may have individual fire ratings get proposed and accepted, yet they may not be part of a proven fire rated system."

"A vast majority of the curtain wall assemblies are being installed incorrectly to the point that if a big fire hits, the insulation system is going to fail and lives will be in danger," Usher adds.

Morrison confirms this, adding that
there is a multitude of substandard work being done. He cites as an example a 42-story building in the south-east U.S. which he knows was specified for a fire rated batt system, but was installed with a thin coat of fiberglass with a plain foil facing, a system he believes will not hold up in a fire.

“The insulation end of commercial jobs has always been considered a secondary concern by the construction industry,” Usher says. “As awareness grows that there is a right and wrong way to install insulation for fire protection, those insulation contractors who take it upon themselves to acquire the necessary expertise will also help our industry gain the respect it deserves.”

Roger McKenzie of Alpha Insulation is using fire resistant Partek basaltic wool and rock wool insulations more frequently in partitions and curtain wall assemblies.

Stricter Standards
Out of Marietta, Georgia, Roger McKenzie, executive vice president of Alpha Insulation Company, is seeing more stringent codes each year. “Over the last 10 years, codes have become 20% more stringent. While this means a 1/2% cost increase to construction projects, it can also translate to a life safety increase of 25-30%.”

“We’re seeing organizations like hospitals tighten life safety measures, insisting on firestop materials and third party tested assemblies,” McKenzie said. “With many of the jobs--like hospitals serving semi-restrained populations--we are seeing stricter requirements that nearly all walls have a fire rating that limits fires to the area in which they originate.”

McKenzie’s firm is now using a higher melt point, fire resistant basaltic wool and rock wool material in many of its interior wall assemblies. In areas where duct work, plumbing or electrical conduit penetrates the rated wall assembly, specific firestop materials are being used.

Much of the push is coming from fire marshals and insurance companies requiring systems which have a two to three hour fire test rating, McKenzie notes. “They have become more aware that more people die from
Fairfax Hospital takes fire and its suppression seriously. Inhalation of gas and smoke than the flames. By containing the smoke and fire, they increase the chances of people escaping,” he says.

Jim Bower, president of Flame Stop, Inc., a Texas-based manufacturer of intumescent firestop caulking and putties, says, “It used to be that holes penetrating curtain wall systems and partitions were filled in with drywall mud, pieces of insulation or newspaper. There has been a dramatic increase in demand for recognized firestop materials. Today all holes penetrating fire rated systems need to be filled with a firestop material with an hourly fire rating equal to the rating of the structure itself.”

Manufacturers of firestop materials have been around for about eight years, but they have never had the growth opportunity they have now. We’ve seen more than a 30% increase in orders over the last year,” Bower notes.

There are three acceptable firestop materials made of either intumescent, mortar, or silicone materials. The most multi-purpose is an intumescent material which expands when it gets hot. Expansion of the firestop material is essential to fill the space left by plastic piping, electrical jacketing and other materials which, while penetrating the insulation assembly, have now collapsed or burned away in the early minutes of a fire. Mortar products are effective when used around steel structures, like steel pipe, which will not collapse and leave an air space. Silicone materials are usually more durable than mortar but, like mortar, are non-expanding.

“Flame Stop’s intumescent material can be applied all by itself as a three-hour firestop system, but the
material is five or more times as expensive as rock wool. For the most economic firestop system that will maintain its form, heat and smoke resistance, we recommend a minimum amount of intumescent material required in combination with rock wool insulation,” he notes.

Dan Christensen heads up the North American commercial products division for Partek, a 4-year-old supplier and manufacturer of Paroc basaltic curtain wall, safing and sound attenuation batts worldwide. Paroc basalt products are similar to other slag wool products but are made from basalt, a volcanic rock, with higher melt point temperatures than other commercial insulations. Christensen says, “We’re finding insulation applicators, architects and contractors want hard cold facts about the products. Today, we wouldn’t have a market for our basaltic wool products if they didn’t perform under independent testing. We find it important to provide the industry with individual product performance, yet we’re most interested in providing systems data from third-party accredited laboratories.”

Partek, like other insulation manufacturers, is seeing the need to provide more in-depth testing data and a range of facings and thicknesses to meet localized conditions and needs. “Partek tested an aluminum spandrel curtain wall assembly to the industry standard, the modified ASTM E-119, and was evaluated for a fire stopping ability up to 2.5 hours,” says Christensen. “Because we see the trend toward even tougher standards, we’ve gone ahead and passed a full ASTM E-119 through Underwriters Laboratories using our Curtain Wall 8.”

James Cornwell, an associate and architect with Robert Lynn Associates of Philadelphia, says they were very conscious of fire and its suppression with the addition of a birthing and children’s center at Fairfax Hospital in Virginia. The building’s curtain wall system (curtain wall and safing), using rock wool, was installed to maintain a closure between the windowsill on the upper floor to the top of the window on the floor directly below and the intervening slab to maintain integrity between the floors. Additionally, firestops were required for a number of interior walls. The curtain wall system derives its fire rating from the rock wool closure, Cornwell says. The fire suppression system used is a sprinkler system.

Michael Katzin, project architect and assistant to the specification director at Thompson, Ventulett, Stainbeck & Associates Architects in Atlanta, says “Over the past one to two years we have seen the model building codes catching up with new technology and safety expectations.” From an architect’s standpoint, Katzin says insulation manufacturers need to provide more insulation/wall assembly variations specific to smoke and flame spread retention for wall assemblies through third party testing laboratories, such as Underwriters Laboratories. It’s been common practice for architects and code authorities to adapt existing insulation assemblies within reason to match existing design needs, he says.
Industry Pursues Solutions

Morrison says there’s an increased awareness of the lack of standards within the construction industry for commercial insulation products. To build the integrity and image of insulation applicators, Morrison and Usher are among nine representatives of regional and national firms sitting on an Insulation Contractors Association of America Commercial Building Insulation Committee. The committee is about to kick off a national informational and educational program planned early this year.

The goals of the program include going to inspection departments to gain their interest and support for tighter standards; persuading architects to enforce what they specify in their designs; and providing insulation applicators with a certification program.

“There has been resistance to a self-policing structure, yet there has been strong reception by fire marshals and inspectors--the ones who can shut down projects if something isn’t right,” Morrison says. “Inspectors are interested in learning how systems perform and install, and are learning to use caution when considering substitute products.”

“Every organization is welcome to apply for certification,” Morrison says, noting, “It’s taken the committee about two years to develop what it considers to be a fair and reasonable criteria which includes: three years experience, bondable status, financial stability, level of liability coverage, size and extent of jobs, and general contractor and architect references.”

At the same time, the American Architectural Manufacturers Association has established the Fire Safety in High-rise Construction Committee. Usher, who also sits on this committee, says the goal is to bring code authorities, architects, general contractors, and insulation applicators to embrace the same principles and standards when it comes to a fire-proven insulating assembly. This includes making sure the curtain wall insulation is mechanically attached and stiffened and the insulation covering the curtain wall framing has been mechanically fastened with fireproof materials.

“What we’ve got to do as insulation applicators to assure a thermal envelope with integrity is to install a completely sealed vapor retarder system and insure that the components of the system have a fire rated assembly,” Usher says.

As industry groups look at developing and maintaining a new level of standardization, there are those who feel it’s worth the limited increase in construction costs, time and energy it will take to establish an industry accountability program, and to assure that insulation, through correct installation procedures, is doing all it can to make buildings safer places.