



THE MAGAZINE OF EFFECTIVE COMPARTMENTATION

Life Safety DIGEST

FALL 2018

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'DIIM' – THE INDUSTRY STANDARD FOR QUALITY

The Firestop Contractors International Association (FCIA) has focused the industry standards for quality through the **'DIIM' of Firestopping process** - the proper **'D'-Design, 'I'-Installation, 'I'-Inspection and 'M'-Maintenance/Management** of firestopping - for fire- and life-safety since its inception in 1999.

The FCIA has developed a complete package for 'DIIM' by working with the Contractor, Manufacturer and Consultant members to build meaningful standards, approvals and qualifications for firestop installation.

The idea is that following 'DIIM' results in installations that match the tested and listed design listings and manufacturers' installation instructions not just at installation, but for the building's complete life-cycle. While it's true that following the 'DIIM' includes many parties, we believe it provides reliable fire- and life-safety when called upon by fire.

The **'D'-Design** is the Manufacturer's investment in testing at the leading laboratories like UL, FM Approvals, Intertek and others. We have great respect for the companies that have invested in technologies and systems that are designed to protect holes, breaches, gaps, voids, joints - preventing fire, and when applicable, smoke spread in buildings outside the compartment of origin. 'D'-Design is also a well-detailed single 07 48 00 Firestopping specification for both penetrations and joints for eliminating confusion on jobsites.

The **'I'-Installation** part of firestopping's 'DIIM' focuses on the Firestop Contractor company and the process, or management system, it uses to get firestopping installed to the Tested and Listed Firestop System and Manufacturers' installation instructions.

MORE ON 'I'-INSTALLATION

The Manufacturers of firestop products invest millions of dollars in research, product development, and testing to prove the products work as intended. Once the product is produced to strict standards, the product is transported either to a Distributor then Contractor, or directly to a project construction site. If the Manufacturers have invested heavily making sure the product is just right, what programs exist to make sure the installation is according to the listings and Manufacturers' installation instructions?



It is key that labels reflect the installed system. If not, it's a variance to the system and possible rejection. Performance Firestop Photo.

That's where the FM 4991, *Standard for the Approval of Firestop Contractors*, or the UL/ULC Qualified Firestop Contractor Programs (UL QFCP) step in. Firestop products might look easy to install, but it's the SYSTEMS that make the product installation complex. Change a penetrating item and the system might change. Adjust the annular space or gap size, and again, the system might change.

A management system and zero tolerance installation protocol is needed to get firestop products installed to the Tested and Listed Systems designs from various directories matching the conditions at the jobsite.

The FM 4991 Approved and UL QFCP Programs are critical to the successful installation of a Firestop System. There are several components in these programs that drive the Contractor company to a quality installation:



Writing - and PASSING - the Firestop Exams positions qualified individuals to serve as DRI for their company and prove that Inspectors have competence. FCIA photo.

DESIGNATED RESPONSIBLE INDIVIDUAL

Both the FM 4991 Approved Contractor and UL/ULC QFCP require that an individual take - and pass with an 80% score - an examination based on the FCIA Firestop Manual of Practice, Systems Selection and Analysis and the FM and UL/ULC Programs. The FM Firestop Exam will have questions based on the FM 4991 Approval Standard while the UL/ULC Firestop Exam will have questions on the UL/ULC Program Requirements. Further, both the FM and UL/ULC Firestop Exams have questions on inspection as it's not only a vital part of the contractor quality control program, but is also required by the International Building Code in Chapter 17, Special Inspection and Tests.

Once the person passes the exam and the company becomes a FM 4991 Approved or UL/ULC QFCP company, the firm appoints the person that passed the exam as the Designated Responsible Individual, or DRI.

QUALITY MANAGEMENT SYSTEM

Both programs - the FM 4991 Firestop Contractor Approval and UL's QFCP - require a Quality Management System (QMS), the first step towards either company-based credential. This means simply having someone on staff who passed the Firestop Exam does not qualify the company as FM 4991 Approved or UL/ULC Qualified.

In a Quality Management System, the Firestop Contractor company must demonstrate that they have procedures in place to ensure firestopping happens in the field correctly. The QMS is a custom, company-specific set of processes and procedures for quality

assurance, systems selection/analysis, communication of the tested and listed systems and Manufacturers' installation instructions to field workers.

The procedures are all documented in a Quality Management System Manual that is unique to each contractor company. It's unique because not every company operates the same, which makes it unique to the company and their competitive advantage.

There are some requirements that must be met by companies who are FM 4991 Approved or UL/ULC Qualified. In addition to a QMS, the firestop company must employ a person who has passed an exam, referenced above.

QUALITY MANAGEMENT SYSTEM MANUAL TOPICS

There are several topics that need to be addressed by the company with procedures - in other words, a management system.

- **Estimates, Proposals, Decisions, Job Start, Plans & Specs, Manufacturers Installation Instructions & Tested and Listed Systems** - Estimated systems become the work orders.
- **Employee Training & Education, with Documentation as Proof** - Firestop Containment Workers need to be trained in systems documentation, product technology and manufacturers installation instructions.
- **Systems Selection & Analysis** - This is the basis of the firestop industry. Firestop Contractors need to select and install firestop systems. Selection takes place during the estimate time, prior to providing proposals. The systems selected become the tool used to submit for approval from General Contractors, Building Owners and Managers, Fire Marshals/Inspectors and Building Code Officials. After installation, the systems selected are reviewed by the Contractor personnel for quality control. The same systems are also used by 3rd-party Specialty Inspection Agencies during their inspections.
- **Communication of Systems to Field** - This encompasses Tested and Listed Systems, Manufacturers installation instructions and Safety Data Sheets.
- **Material Controls, Shelf Life, Defectives** - Materials need to reflect the systems and not be installed after the expiration/expiry date, unless documented as allowed by the Manufacturer. Freezing and hot storage also need to be addressed.

- **Systems installation "protocol" to the Systems Selected - See Above, Systems Selection & Analysis.** This is the basis of the industry. Without knowing systems, the result that Firestopping got installed correctly is a lucky guess at best.
- **Labeling Procedures, When Applicable** - In the FM 4991 Standard, there is a requirement that if FM Approvals Labeling is required by specification, that the labels follow the design below. Check out FCIA's NEW Recommended Professional Practice for Identification Systems, and also the Identification Systems Chapter of the FCIA Firestop Manual of Practice, for details.



- **Variance Procedures & Corrective Action**
 - Mistakes happen. How are they fixed and prevented in the future?
- **Documentation & Recordkeeping** - The FM 4991 Approved or UL/ULC QFCP require that the Firestop Contractor maintain records for seven (7) years. The International Fire Code requires that the Building Owner and manager keep records of all fire-resistance-rated and smoke-resistant assemblies.
- **Project Closeout** - In the 2018 International Fire Code, an "Inventory" of fire-resistance-rated assemblies is required to be kept as records by the Building Owner and Manager.
- **Documentation** - The Tested and Listed Firestop Systems, Manufacturers' installation instructions and safety data sheets - of firestop systems - and all fire-resistance-rated construction elements - is required. FM 4991 Approved and UL/ULC Qualified Firestop Contractors have procedures to document systems in their Quality Management System Manual.
- **Purchasing** - The purchasing process for firestopping in management system-based programs requires a purchase order system.
- **Management System Review** - At least annually, those responsible for the management system need to perform a self-audit and review of the program to be sure it's working properly. This is usually prior to the audit by FM Approvals or UL personnel.

AUDIT PROCESS

Third-party Contractor company Quality Management System audits of the firestop company Qualify Management System are required to become FM 4991 or UL/ULC Qualified. These audits are about 1 to 1-1/2 days long. They are provided by nationally recognized testing laboratories like FM Approvals and UL/ULC.

The FM and or UL/ULC auditor reviews project files and files related to the topics above, asking the contractor to prove that they have procedures in place and meet all requirements of the FM 4991 or UL/ULC Qualified Firestop Contractor Program to get firestop materials installed to the listing and Manufacturers' installation instructions.

After an audit takes place at the Firestop Contractor's office, the FM or UL/ULC Auditor then visits a project site with the Contractor to be sure they 'do as they say they do' in the QMS Manual.

In addition to the rigorous office and field audit for initial FM 4991 Approval or UL/ULC Qualification, there are also annual audits performed by FM Approvals or UL/ULC. The annual audit verifies that the Firestop Contractor's processes are still working as they did at the time of the initial audit. Firestop Contractors, FM 4991 Approved or UL/ULC Qualified, can be found at www.FCIA.org on the member lists. These contractors travel wide areas and can service projects worldwide.

ARE MANUFACTURER PROGRAMS EQUAL TO FM 4991 APPROVAL OR UL QFC?

Specifications sometimes require that the Manufacturer approve the Firestop Contractors. There are many Firestop Manufacturers that offer programs to meet specification requirements. We are unaware of Manufacturers approving Firestop Contractors. Some specifications even state that the Firestop Manufacturer education or accredited or Manufacturer educated contractor program is equal to the FM 4991 or UL/ULC Qualified Firestop Contractor Programs.

FCIA has great respect for the Firestopping Manufacturers. They have invested heavily in manufacturing, marketing, testing, innovations and personnel. The firestop manufacturer programs are an integral part of contractor company education. They are helpful to the contractor as they develop their management systems and installation protocols. However, the Manufacturer education programs are not equal to the FM 4991 or UL/ULC Qualified Firestop Contractor Programs. First, the Manufacturer accreditation, training programs, are not third-party run programs. There is a direct conflict to objectivity due to the sales relationship between the Manufacturer and



FCIA was the code proponent to add third-party independent inspection to the 2012 and onward International Building Code.
Katz Engineering photo.

Contractor. Also, the Manufacturers' programs do not require an audit of the company office procedures, nor a field audit of the Management System.

'I'-Inspection is gaining ground as the 2012 and later International Building Code (IBC) is adopted by jurisdictions. Inspection by the Contractor of their own work and Inspection Agency third-party independent inspection now take place regularly.

Special Inspectors working for Special Inspection Agencies must prove their competence and experience to the Authorizing Agency (AA) and Authority Having Jurisdiction(AHJ) to become Approved. The International Building Code requires competence and experience in the same type and complexity of materials inspected. That means the inspector should in firestopping pass the FM or UL Firestop Exam and the IFC's Firestop Exam to prove competence. The experience is proven through inspectors past project experience. Specialty Inspection Agencies can also participate in programs for quality, such as the International Accreditation Service's IAS AC 291 program to prove their competence as a company to the AHJ.

Contractor self-inspection, at a less frequent basis than ASTM E 2174/ASTM E 2393 standards mandate, is required in the FM 4991 and UL/ULC QFCP programs. One thing to note: Contractor self-inspection is not the same as the Special Inspection referenced in the IBC.

Finally, the **'M'-Maintenance and Management** of Firestopping and fire-resistance-rated and smoke-resistant construction is an ongoing issue that needs attention by Building Owners and Managers. Some hire this work out to professional Firestop Contractors who perform Barrier Management Services, while other Building Owners perform the annual survey required by the International Fire Code on their own. Looking to find companies that perform Barrier Management Services? Check out FCIA's new website section at www.FCIA.org, Barrier Management Services.

CONCLUSION

Specifiers, consider that your specification should specify FCIA Member, FM 4991 Approved, UL/ULC Qualified Firestop Contractors AND Manufacturer education programs. A specification that says, 'either FM 4991, UL/ULC QFC Firestop Contractors OR Manufacturer accredited' is a specification that will not draw a consistent level of quality assurance from the prospective installation companies. Why? The Manufacturer education program is not equivalent to the FM and UL/ULC Management System-based programs in scope or cost. The Manufacturer organization is not an independent organization auditing the Contractor, creating a conflict.

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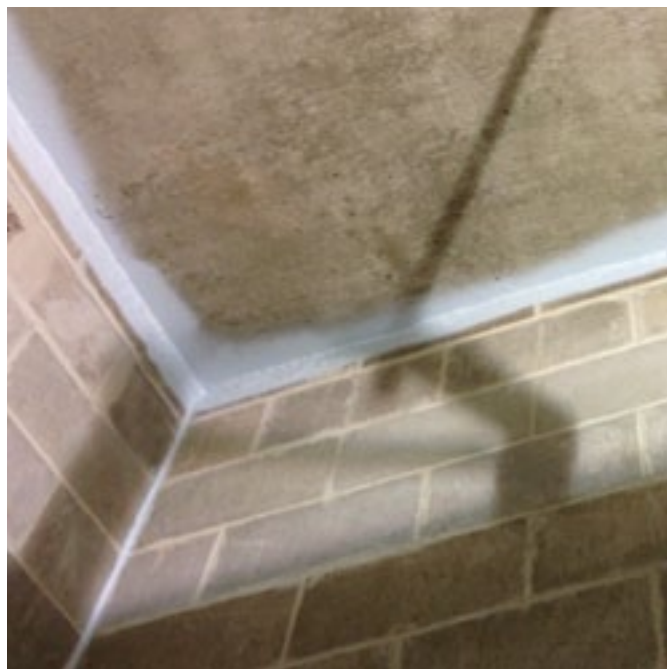
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General Contractors, Building Owners and Managers, check out the value that comes from FCIA Member, FM 4991 Approved Firestop or UL/ULC Qualified Firestop Contractors. There's a reason there are differences between the companies that just 'fire caulk everything' and those who understand what the technical aspects of firestopping are.

There are some that think firestopping is simply 'sealing pipes' with whatever they think is 'Fire Caulk'. Fire Caulk does not extend the fire-resistance of the wall where the breach was made. *It's the FIRESTOP SYSTEM that gets the rating, not the product.* Demand the Tested and Listed Systems and Manufacturers' instructions from those working in your buildings.

Building Owners and Managers, the annual visual inspection, recording of the inspection and repairs of fire-resistance-rated assemblies has been required for years. In existing buildings, check the barriers at least annually and have the barriers and the features that protect them documented into an inventory, as the International Fire Code requires.

FCIA Member, FM 4991 Approved Firestop or UL/ULC Firestop Contractors, thank you for being members and going the extra mile for fire- and life-safety in buildings. Interested in finding or becoming an FCIA Member, FM 4991 Approved or UL/ULC Qualified Firestop Contractor? Visit www.FCIA.org and you'll find all you need.



The MACC verifies that the Quality Management System processes in place are actually being followed in the field. Performance Firestop photo.

SIDEBAR

UL Announces a New Enhancement to UL Qualified Firestop Contractor Program

UL's Qualified Firestop Contractor Program (UL QFCP) has been in the industry for over 10 years now. As part of continued improvement, FCIA and UL partnered to develop the MACC - the Master Audit Certificate of Compliance.

This new program is an optional additional service UL can provide for UL QFC's and their Building Owner and Manager Partners. This new certificate brings great value to the Building Owner that they can use with insurance companies, AHJ's and others.

The new MACC program - available worldwide - includes a job site audit of the UL QFCP's Management System and a certificate for the Firestop Contractor to provide to the Building Owner and/or Manager that the contractor was found to be in compliance. The MACC even references the need for the Building Owner to comply with the International Fire Code requirement for annual visual inspection of fire-resistance including firestopping. And, the MACC is available only to UL QFCP's.

Watch for the UL Announcement and details shortly with a full explanation at FCIA's Symposium in Winnipeg and the FCIA Firestop Industry Conference & Trade Show in Austin, TX. 🔥

Save the Date

FCIA Firestop Industry Conference & Trade Show

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November 6-9, 2018

