



FCIA Identification Systems for Firestopping - Suggested Fire Resistance Rated Assembly Identification and Labeling in Effective Compartmentation – Appendix D

Background - Identification Systems for Firestop Systems

The purpose of this document is to outline the various options for labeling, or “Identification Systems for Firestop Systems”. It is the responsibility of the design professional, architect, engineer and or Authority Having Jurisdiction to require an identification system for a building using project specifications or other construction documents as the communication tool to the contractor. Construction documents should also be specific instructing the contractor which labeling method to use. Codes may require an identification system communicated to the design professional through code requirements depending on the jurisdiction. The purpose of this section is to provide a discussion of identification systems, or labeling, the history, options available in the industry, plus sample templates.

How does a firestop contractor, design professional, building owner or manager know if a wall or floor is fire resistance rated? What about the hole in the wall / floor with red sealant in it ... is it a fire resistance rated or smoke, radiation, chemical, biological, blast or other resistant wall (or floor) with a fire resistance rated firestop system installed? What firestop system number, manufacturer and contractor were used for the Firestop System? How does an inspector know what he/she is looking at when reviewing the firestop systems during annual reviews of the building safety systems? Answers to these questions may be found through this “Identification Systems for Firestopping” document.

FCIA Members have had requests from building owners, design professionals and others to install labels identifying what firestop system was used on installations in various types fire resistance rated assemblies in buildings. This is in addition to identification of the fire resistance-rated assembly wall or floor. Many FCIA Member Firestop Contractors have provided several types of labels and stencils to identify fire resistance-rated assemblies and firestop systems through those assemblies to meet requirements.

The first requests for identification systems for firestop systems developed in the Nuclear Power Industry. In this environment, a through penetration firestop system (penetration seal as it is known in nuclear plants) was identified through a specific identification number at the penetration seal area on a wall or floor, with a number which corresponded to a file in the central record keeping area. The complete tested system documentation for that firestop system would be documented in this file, with test results, hourly fire ratings, radiation or pressure certifications and other information pertinent to that specific firestop system.

Industrial building owners have also requested identification systems for firestopping in the field. Some commercial, educational, health care and other occupancies have requested identification systems for fire resistance rated assemblies and firestopping over the years as well.

The FM Standard, (FM 4991) *Standard for the Approval of Firestop Contractors, Class 4991*, discusses labeling of penetrations. FM 4991 does not require labels, unless the design professional or owner requests it of the FM Approved Contractor through the construction documents. If an identification system is required, the FM 4991 Contractor invokes a special procedure outlined in the standard. See FM 4991 for specific installation instructions and label content. The UL Qualified Firestop Contractor Program has no requirements written for labeling other than to follow customer requirements. FCIA Member Firestop Contractors, Manufacturers and Associate members, have reported an increased demand for identification systems by building owners and managers, design professionals and generally provide as required by specification.

What is identification?

Identification for Fire Resistance Rated Assemblies is not new to the construction industry and effective compartmentation. Stencil painted fire walls, or large label attachments have shown hourly fire resistance ratings and smoke or other resistant systems for many years. Fire doors have been marked with metal tags riveted to doors and frames with builder's hardware identifying the door as a fire resistance rated assembly. Fire and Smoke Dampers have been sometimes marked as well. Identification for Firestop Systems through labeling has been requested of FCIA Members in various forms to complete the firestopping application.

Fire and smoke barrier walls are marked by stencil or labels.



Example of a label for fire / smoke resistance rated assembly
C.L. Downey Construction, Inc. label

Doors passing through fire resistance rated assemblies are also required to be fire resistance rated. These Fire Doors are also marked both on the door frame and door assembly. The hardware must also be listed for the specific use in a rated assembly.

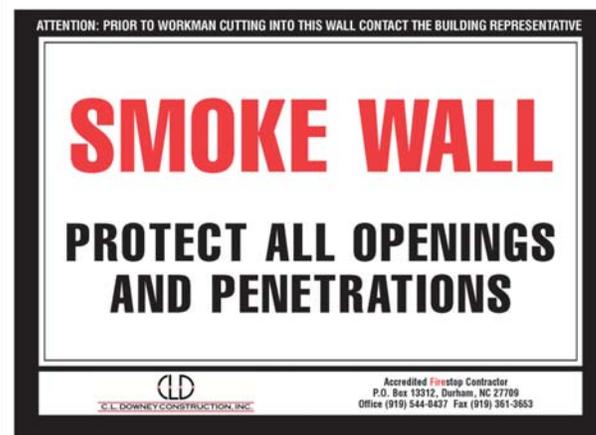
Firestopping systems are also installed, and marked by specialty firestop contractors worldwide. .

Why Identify Firestop Systems in buildings?

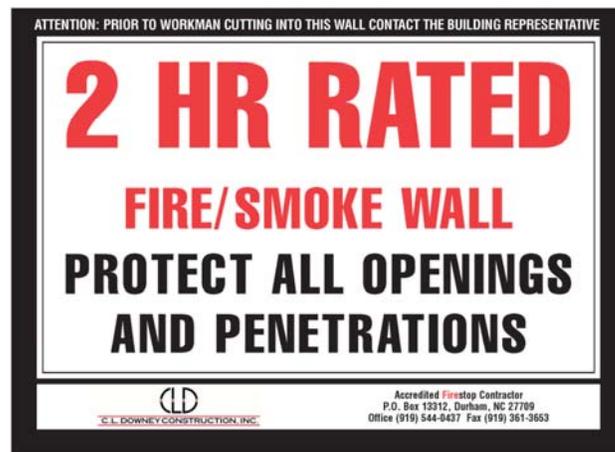
There are significant economic, fire and life safety benefits to the building owner and manager when adequate identification systems are required on projects.

The FCIA Member, Firestopping Contractor Professional who installs a firestop identification system saves the firestop inspection firm, AHJ, and building owner significant time during later maintenance and inspection because systems research is minimized for the inspector and building manager/ engineer.

Most important, the “DO NOT DISTURB” or “CONTACT BUILDING PERSONNEL BEFORE ALTERING” sign usually indicates to trades or others who might alter the firestop system to stay away. Additionally, identification systems may be required for fire walls, fire and smoke walls, smoke walls and barriers, or partitions as well.



C.L.Downey Construction, Inc. label.



C.L.Downey Construction, Inc., label

Post installation building firestop systems *inspection time is reduced* as there is little research required by the inspector to identify which system design to locate to perform verification services. If the tested system number is on the wall or floor, it's only a matter of finding the right page in the tested system directory from the label on the assembly. For maintenance personnel, the research efforts required to identify a firestop system are minimized. This means that the initial systems selection performed by the contractor does not have to be rediscovered anyone during initial construction, renovation, or annual inspection programs for the life of the buildings.



Apex Firestop, LP photo

Identification methods can be very cost effective, and allow excellent specific information right at the system location in the field for a wide variety of firms and individuals who come in contact with the firestop system over the life of the building. Although there may be some minor initial costs added to a firestop application, the long term inspection and maintenance savings can be dramatic over the building life cycle.

Specific Identification for Firestop Systems

FCIA Members report that identification systems for firestopping are being requested at commercial, institutional, educational and other occupancies. Identification systems include stencil painting, simple paper labels and plastic tear away special labels and bar code systems. Label sizes vary by owner or AHJ requirements. Some owners in the industrial environment prefer stamped metal tags, attached to the service item that penetrates the wall or floor assembly with a metal string, or a ceramic fiber version of the tag. Listed below are the types of identification systems for firestops:

Stencil Painting – The simplest type of identification system is stencil paint on the wall or floor next to the firestop system. The stencil painting method is typically used to identify the floor or wall assembly as hourly fire or smoke rated, partition, or other assembly type.



Stencil Painted Identification System

The advantage of this method is the ease of application. A simple “fire resistance rated assembly” stencil can be painted quickly and without much labor or technical expertise required. Disadvantages include the complexity that develops when many different tested and listed systems are required to complete an application in close proximity. Also, there is difficulty stenciling where space is limited. Plus the flammability, odor and overspray potential of spray paint in a building makes it difficult, unless a latex paint is used. This method is very effective for identifying the fire or smoke resistance-rated assembly, just not the firestopping system.

Paper Stickers – FCIA Members have reported requests for simple adhesive attached paper stickers with appropriate identification items or bar codes pre-printed for ease of application.

Advantages include the ability to custom print the identification system, with the exact system number identifier on the sticker. These stickers, varying in size, can be specially made for each contractor firm, system type, and design professional or owner request, as most are printed at the contractor’s office, through a typical printer. These stickers do provide a more professional look over the stencil painted method.

The disadvantage of the simple paper stickers is that they may require secondary adhesives or stapling for long term adhesion. If not adhered

properly, the stickers may dislodge from the wall or penetrating item and fall to the ground. Also, in the case of a fire, the identification system may perish or become not legible.

Paper/Plastic Tear away Stickers – Custom stickers can be ordered from suppliers that are made from tear away materials, such that the sticker will self destruct upon removal from the wall or floor assembly. The advantage is the ability to have a secure sticker once installed. The disadvantage is that they can be more expensive than the simple paper style sticker.

Metal tags – Imprinted metal tags, custom fabricated for each through penetration firestop system, are being used when requested by certain types of building owners for identification systems. FCIA Member, specialty firestop contractors report requests for metal tags that can be hung from penetrating items with metal string.

Advantages of this method include a very durable, fire resistant identification system that may allow identification of the firestop after a fire has occurred in the area. Imprinting as a printing method provides long term life since the identification system isn't relying on ink that can fade over time. Additionally, metal tags are very professional aesthetically, drawing attention to the importance of this firestop system that protects fire and life safety while adding property protection and minimization of downtime if damage occurs.

Disadvantages include the cost of the tag and time required to install vs. a paper or stencil identification system. If a fire were to become hot enough, there may be deformation or melting of the steel tag, reducing the ability to identify the firestop system.

Ceramic Fiber Tags – Ceramic fiber firestop system tags are much like the metal version, also imprinted, and very resistant to fire exposure. The advantage of the ceramic fiber tag is the ability to survive extreme fire conditions and still identify the marking on the tag. Imprinting as a printing method provides long term life as the printing isn't relying on ink that can fade over time. Ceramic fiber tags are also very professional aesthetically, drawing attention to the importance of this firestop system that protects fire and life safety while adding property protection and minimization of downtime if damage occurs.

As with the metal version, cost and labor are the disadvantage of the system. For both the metal and ceramic fiber versions of these tags, excellent long term performance in a number of conditions can be expected.

Placement of Identification Systems for Firestop –

Various Authorities Having Jurisdiction (AHJ's) and other entities recommend that fire resistance rated wall assemblies be identified. Typically, the wall identification marking is above the drop ceiling area, approx. 12" from the top of the wall, with print sized to be read from the ground level.

The International Code Council's International Building Code, 2007 Supplement requires installation of labels on fire and smoke barriers, with the following requirements:

703.6 (Supp) Marking and Identification. Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. Such identification shall:

1. Be located above any decorative ceiling, in concealed spaces or other approved location;
2. Be repeated at intervals not exceeding 30 feet (914 mm) measured horizontally along the wall or partition;
and
3. Include lettering not less than 0.5 inch (12.7 mm) in height, incorporating the suggested wording: "FIRE AND/OR SMOKE BARRIER – PROTECT ALL OPENINGS", or other approved wording.

Exception: Walls in Group R-2 occupancies that do not have a removable decorative ceiling allowing access to the concealed space.

These requirements in the International Building Code set the minimum requirements for labels that identify the barrier.

The Firestop Systems labels are recommended to be installed at each penetrating item, on the wall or floor, unless there are multiple firestop systems in the same area, with close proximity limiting access to the area for installation and readability of the identification system.

Multiple penetrating item firestop systems present difficulties identifying with labels and tags. Stickers identifying systems can be affixed off to the side of the assembly, noting each penetration system with a separate label. For spacing and accessibility recommendations that should be understood during the project design phase, see FCIA document on Standards for Location of Penetration Piping, Cables, Ducts, etc.

Generally, Identification Systems for Firestopping occur within 2" of the penetration, with a label affixed to the wall. The tag versions are 'hung' on horizontal and vertical piping systems, and riveted or stapled to joint, walltop or perimeter system areas.

Firestopping labels can be installed in Perimeter Fire Protection Systems. The system may or may not be required by construction document specifications or authority having jurisdiction as the system is installed behind a concealed space. They would come into play during renovations which may occur every 20 years as walls are moved, opened, replaced.

When is identification used? Does it save the building owner/manager money?

Firestop Systems identification labels are used by building owners and managers, architects and engineers who want to invoke a final inspection after construction and before occupancy. Periodic inspections of effective compartmentation after the initial construction including fire resistance and smoke resistant or both fire and smoke resistant assembly's makes good business sense. The many services that exist in a building tend to cause breaches in that fire resistance rated assembly. Maintaining the integrity of these barriers is important to maintain fire and life safety. This is also why firestop systems identification is important.

The identification system for Effective Compartmentation should include fire doors, fire glass, fire and smoke dampers, through penetration and top of wall and joint system firestop systems. The fire rated glazing industry already has code requirements for labeling fire resistance rated glass. Below is an excerpt from the International Building Code, 2007 Supplement:

715.4.6.3.1 Identification. For fire protection-rated glazing, the label shall bear the following four-part identification: "D – H or NH – T or NT – XXX." "D" indicates that the glazing shall be used in fire door assemblies and that the glazing meets the fire protection requirements of NFPA 252. "H" shall indicate that the glazing meets the hose stream requirements of NFPA 252. "NH" shall indicate that the glazing does not meet the hose stream requirements of the test. "T" shall indicate that the glazing meets the temperature requirements of Section 715.4.4.1. "NT" shall indicate that the glazing does not meet the temperature requirements of Section 715.4.4.1. The placeholder "XXX" shall specify the fire-protection-rating period, in minutes.

There are also requirements for marking fire doors as well in the International Building Code, 2007 Supplement:

715.4.5.1 Fire door labeling requirements. Fire doors shall be labeled showing the name of the manufacturer or other identification readily traceable back to the manufacturer, the name or trademark of the third-party inspection agency, the fire protection rating and, where required for fire doors in exit enclosures and exit passageways by Section 715.4.4, the maximum transmitted temperature end point. Smoke and draft control doors complying with UL 1784 shall be labeled as such and shall also comply with Section 715.4.5.3. Labels shall be approved and permanently affixed. The label shall be applied at the factory or location where fabrication and assembly are performed.

Although the initial cost for installed firestop systems may be somewhat more than without identification, the savings in inspection and maintenance later in

the building's life cycle can more than make up for the small additional cost to the building owner.

There are about 4,500 tested and listed systems in the Underwriters Laboratories (UL) Fire Resistance Directory alone. The 4500 UL system count does not include Omega Point Laboratories and Warnock Hersey directories either. One of the most time consuming activities in firestopping is researching to identify the correct firestop system that matches the conditions on drawings or in the field.

The FCIA Member specialty firestop contractor researches and selects firestop systems for installation as the very first activity, even before assigning a cost to the project. The "Systems" are the basis for estimates of time and material costs for the FCIA Firestop Contractor Member. Since the research is done at the systems selection and installation phase of firestop installation, it is cost effective for the firestop contractor to produce and mark / identify the firestop systems using labels or other methods. Identifying firestop systems after installation requires destructive testing of the firestopping, then much research to understand which manufacturers' products and tested and listed systems or engineering judgments were used. With labels present, the guesswork and system identification difficulties are no longer problematic and time saved immense.

The reason that inspection and maintenance costs reduce is that in effective compartmentation, components are documented together as a tested and listed system. Without the documentation, identification of the firestop system is impossible. Since the FCIA Member Firestop Contractor is identifying the system at the beginning of the process, all later members of the building team benefit from information gathered once. The Firestop Identification System is a very efficient use of resources just as the fire door and fire rated glazing assemblies as well.

Firestop Identification System Label text content

There have been many formats developed for firestop system labels. There are several types of labels that have been used for Firestop Identification Systems. The "Minimum Text" version simply warns future trespassers that there is a firestop system installed, and that tampering may cause failure of the system to operate when needed. The "More Detailed" systems add the tested system number and much more,

Text for identification of firestop systems can vary based on the needs of the specific project. It is the building owner - manager or design professional's responsibility to select the type and content of identification system required for various applications. Listed below are several option levels of identification:

Firestop Label Number 1 - Minimum text for identification system – The advantage is notification that disturbing this firestop system could cause failure. As a disadvantage, since the system number is not on the identification, traceability and its economic advantages are not realized.

Firestop System Label # 1 – “Least text”

Do Not Disturb

Fire Resistance Rated Firestop System

Removing or tampering may affect system performance

Firestop System Label Number 2 - More Detailed text for identification system – This identification system adds detail that brings economic and time savings for future inspection by qualified professionals who will need to verify the system through visual and destructive testing. The disadvantage is that it lacks detail about the submittal or building file reference.

Label #2 – “More text”

Do not disturb

Fire Resistance Rated Firestop System

Removing or tampering may affect system performance

Tested System Number: _____

Engineering Judgment Number: _____

Firestop Contractor: _____

Firestop Contractor Address, phone: _____

Label Number 3 - Most Detailed text for identification system – This identification system captures much information for the firestop system. Product lot numbers, submittal numbers, inspection dates are part of this label allowing significant inspection ease as information is complete at the location of the firestopping system.

As a disadvantage, this level of detail does cost more than the minimum and more detailed versions, and provides information that may or may not be needed during the building life cycle.

A bar code system may increase the speed of contractor implementation of this system can provide benefits to the building owner and manager, contractor and inspector.

Label #3 – “Most text”

Do not disturb

Fire Resistance Rated Firestop System

Removing or tampering may affect system performance

Tested System Number: _____

Engineering Judgment Number: _____

Firestop Product Lot #: _____

Firestop Location Code: _____

Firestop Contractor: _____

Firestop Contractor Address, phone: _____

FM 4991 Approval Number: _____

Firestop Submittal Number: _____

Firestop Inspection Date & Initials: _____

Label #3A – “Even more text”

Do not disturb

Fire Resistance Rated Firestop System

Removing or tampering may affect system performance

Label/Tag Number: _____

Tested System Number: _____

Ratings: F__ T__ L__ W__ H__ Radiation: _____

Engineering Judgment Number: _____

Firestop Product Name: _____

Firestop Product Lot #: _____

Firestop Location Code: _____

Firestop Contractor: _____

Firestop Contractor Address, phone: _____

FM 4991 Approved Contractor: _____

UL Qualified Firestop Contractor:

Firestop Submittal Number: _____

Firestop Installation Date:

Firestop Inspection Date & Initials: _____

Label Number 4 - FM 4991 Identification System –Standard for the Approval of Firestop Contractors – For exclusive use - FM 4991 Approved Firestop Contractors

Label #4 – FM 4991 Requirements

FM Approvals LOGO

Installed by _____ **Contractor Firm Name &**

Address a Factory Mutual Research Approved Firestop Contractor

Do Not Disturb – Fire Resistance Rated System

Serial No.: _____

OPTIONAL: Firestop Contractor may include other pertinent information as well.

NOTE AN EXCEPTION FOR ENGINEERING JUGEMENTS/EFRRRA'S:
Under the FM 4991 Protocol, contractors shall be allowed to place a label or marking for such assemblies; however, any such label or marking shall be prohibited from using the words "Approved", "Factory Mutual Research or Factory Mutual – FM Approvals, or any reference to the FM 4991 Program, express or implied, that indicate FM Approval as a Firestop Contractor or installation.

The FM 4991 Identification system has very specific requirements. When required by specification, each fire resistance rated system installed by a FM 4991 Approved Firestop Contractor shall bear a permanent label or marking. Metallic Labels shall be secured with permanent fasteners. Plastic labels shall be self adhering and shall be evaluated for adhesive quality for the proposed substrates. The adhesive and label shall provide for partial destruction of the label when removal is attempted.

When installing Firestop Identification System labels in the field on penetration type firestop systems, FM requires the label be located adjacent to or within 6" (150mm) of any edge of the system or assembly. For Head of Wall assemblies, expansion joints and floor/exterior wall slab edge type firestop systems or assemblies, the label or marking shall be located adjacent to or within 6" (150mm) of the firestop system or assembly and spaced not more than 50' (15.2 m) on center. Labels may be omitted if they would be visible in a finished area with the written authorization of the AHJ. Additionally, FM Approvals requires application of labels within thirty (30) days of completing the installation of the individual firestop.

Summary

Regardless of which type of identification system for firestopping is used, additional fire and life safety savings can be realized by the building owner and manager and safety for occupants through a documented firestopping installation. Identifying that a firestop system is in place alerts future workers, inspectors, building code officials and fire marshals that altering the system can mean failure, property damage or lives lost. And, once labeled, future maintenance costs are reduced significantly as research time is minimized.

FCIA Firestop Contractor Members believe Identification Systems for Firestopping makes sense for the entire construction team in the long run when included in the firestopping scope of work. When Authorities Having Jurisdiction, Architects and building owners and managers request Effective Compartmentation be identified, the Firestopping industry can provide the requested information.

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