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Standard Practice for On-Site Inspection of Installed ~~Firestops~~Firestop Systems[1]

This standard is issued under the fixed designation E2174; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice covers the establishing of procedures to inspect firestop products and firestop systems, including methods for field verification and inspection.

NOTE 1—This practice is referenced in the International Building Code, Chapter 17, Special Inspections.

1.2 This practice addresses all types of firestop products that become firestop systems once installed to the tested and listed system or judgment into fire resistive assemblies.

NOTE 2—Firestop System is defined in Test Method E814. Firestop products are the products used in constructing a firestop system.

1.3 This practice provides methods by which qualified inspectors verify that required firestops on a project have been installed and that their installations are in accordance with the inspection documents.

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *The text of this standard references notes and footnotes that provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.*

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]
C1241 Test Method for Volume Shrinkage of Latex Sealants During Cure
E176 Terminology of Fire Standards
E631 Terminology of Building Constructions
E699 Specification for Agencies Involved in Testing, Quality Assurance, and Evaluating of Manufactured Building Components
E814 Test Method for Fire Tests of Penetration Firestop Systems

2.2 *Other Standard:*[3]
UL 1479-94 Fire Tests of Through-Penetration Firestops

2.3 *Other Document:*[4]
International Building Code

3. Terminology

3.1 *Definitions*—Terms defined in Terminology E631, Terminology E176, and Specification E699 will prevail for terms not defined in this document.

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[1] This practice is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.21 on Serviceability.
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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from Underwriters Laboratories (UL), 2600 N.W. Lake Rd., Camas, WA 98607-8542, http://www.ul.com.

[4] Available from International Code Council (ICC), 500 New Jersey Ave., NW, 6th Floor, Washington, DC 20001, http://www.iccsafe.org.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *accredited testing laboratory*—a company engaged in conducting testing and possesses a valid evaluation report for testing services and is recognized by the AHJ.

3.2.2 *authority having jurisdiction (AHJ)*—the designated authority, or their duly authorized representative, charged with the administration and enforcement of the local fire code or building code, or both.

3.2.3 *authorizing authority (AA)*—the designated person, or organization, or their duly authorized representative, charged with the administration and enforcement of the provisions of this inspection document.

3.2.3.1 *Discussion*—

Examples of the AA include the responsible architect, engineer, building owner, or their representative.

3.2.4 *evaluation report*—an approved document issued by the Model Code Body Evaluation Service or by the AHJ.

3.2.5 *inspection document*—any information provided to the inspector by the AA that is to be used as the basis for the inspection process. This information shall include, but is not limited to, project specifications, contract drawings, Listed Designs, judgments, manufacturer's instructions and designs, building codes, and other documentation.

3.2.5.1 *Discussion*—

The approved firestop submittal typically includes the firestop manufacturer's product data, a design listing of the tested firestop system or the engineering judgment design with illustrated drawings or descriptive text or both for the purpose of verifying each installation and conducting the field-inspection procedures.

3.2.6 *inspection form*—the document contained in this standard practice that is used to record information obtained during the inspection(s).

3.2.7 *inspector*—an individual meeting the qualifications set forth in this document and who performs the inspection.

3.2.8 *judgment*—an evaluation of a field condition which does not conform to an existing tested and listed system.

3.2.8.1 *Discussion*—

Judgments are expected to be issued by a manufacturer or an accredited testing laboratory on the basis of an appropriate combination of engineering principles and testing.

3.2.8.2 *Discussion*—

The judgment is commonly referred to as an "Engineering Judgment" in the firestopping industry. These judgments are not always issued by engineers.

3.2.8.3 *Discussion*—

Some AHJs allow a judgment by the manufacturer if there is no tested and listed system for the non-typical condition, others do not. Most AHJs will allow judgments by accredited testing laboratories.

3.2.9 *listing label*—identification applied to the product that includes the name of a quality assurance agency indicating that a representative sample of the product or material has been tested and evaluated by the quality assurance agency.

3.2.10 *quality assurance agency*—a company that is engaged in conducting inspections, or certification, or listing and labeling services, or any combination, and possessing a valid evaluation report for quality assurance and is recognized by the AHJ.

4. Summary of Practice

4.1 This practice sets forth the minimum requirements to qualify an inspector to use this practice.

4.2 This practice identifies the types of firestops subject to the inspection procedures outlined in this practice.

4.3 This practice provides the minimum information required to verify compliance of installed firestops with inspection documents.

4.4 This practice provides a standard inspection form that is to be used when inspecting firestop products and firestop systems.

4.5 This practice provides a standard report format that is to be used when reporting the inspection results.

5. Significance and Use

5.1 This practice is intended to provide a standard set of guidelines that are to be followed when conducting and reporting on inspections of installed firestop systems.

5.2 This practice is intended to provide a means to verify compliance of the installed firestop systems to the inspection documents.

5.3 This practice is not intended to provide a basis for selecting installers or products or both.

5.4 This practice is not intended to establish any performance criteria of the inspected firestop systems.

6. Inspector

6.1 *Qualifications*—An inspector shall be acceptable to the AHJ and shall meet at least one of the following requirements:

6.1.1 Meet the criteria contained in Specification E699 for agencies involved in quality assurance; or

6.1.2 Have a minimum of two years experience in construction field inspections and have education, credentials, and experience acceptable to the AA; or

6.1.3 Be a quality assurance agency accredited by the AHJ.

6.2 *Conflicts of Interest:*

6.2.1 The inspector shall be completely independent of, and divested from, the installer, contractor, manufacturer, or supplier of any material being inspected.

6.2.2 The inspector shall not be a competitor of the installer, contractor, manufacturer, or supplier of any material being inspected.

6.3 The inspector shall submit notarized statements to the AA assuring compliance with 6.2.

6.4 The inspector shall make a written submission to the AA requesting acceptance. If accepted, the AA shall present the inspector with written confirmation of acceptance.

7. Inspection Documents

7.1 The inspection documents shall be reviewed by and acceptable to the AA and AHJ.

7.2 The AA shall be responsible for ensuring that the inspection documents do not contain conflicting information.

7.3 The AA shall provide the inspector with a complete set of inspection documents at least ten working days prior to the inspection. The inspector shall review all inspection documents prior to conducting any inspection. When the inspector believes that the inspection documents contain conflicting information or documentation that the inspector believes is insufficient to perform the inspection, the inspector shall submit written notification of the potential conflict and obtain written clarification from the AA before conducting any inspection.

7.4 As part of the inspection documents, Listed Designs shall be provided for every firestop, as a reference against which to compare the installation. As an alternative for every case where a Listed Design does not exist for a particular application, a judgment issued by the firestop product manufacturer or an accredited testing laboratory, and acceptable to the AHJ, shall be provided as a reference against which to compare and inspect the installation.

8. Materials

8.1 The inspector shall verify that the materials and systems used for firestopping have been tested in accordance with Test Method E814 or UL 1479-94, and are listed and labeled for the use intended.

NOTE 3—Listed and labeled refers to materials, devices or assemblies that have been tested by an accredited testing laboratory after which the test results and description of the materials, devices or assemblies are published by an accredited quality assurance agency and the materials, devices or assemblies bear a Listing Label.

8.2 All materials shall bear a Listing Label as defined in 3.2.9. Manufacturer's container labels shall include the manufacturer's name, product name and product description. Other components of the firestop shall also be identifiable by labeling or other method approved by the AHJ.

8.3 All materials shall be exactly as identified on the inspection documents.

8.4 All materials used in firestop systems shall have been tested or evaluated as part of the system in accordance with Test Method E814 or UL 1479-94 as required by the building code or fire code, or both.

9. Inspection Schedule

9.1 The inspector and installer shall mutually agree upon a schedule for the notification of the following:

9.1.1 Inspection of firestop materials,

9.1.2 Start of installation, and

9.1.3 Anticipated completion of inspection.

9.2 The inspection schedule shall not interfere with the installation process.

9.3 The installer shall notify the inspector within one working day when any item agreed to on the schedule must be changed due to unforeseen circumstances, such as material delays, project change orders, or other installation conflicts.

10. Inspection

10.1 The inspector shall be permitted to enter the premises to review the applicable inspection documents, to observe the installation in progress, to inspect completed work and to perform overall functions relative to their duty as inspector.

10.2 The inspector shall use the inspection documents in 7.3 to identify and locate fire rated assemblies on the project that are subject to the installation of firestops.

10.3 The installer shall notify the inspector of the arrival of the materials (described in 8.1 – 8.4 inclusive) as agreed to in 9.1.

10.4 Prior to installation, the inspector shall verify that all materials received for the installation of the firestop meet the requirements of 8.1 – 8.4 inclusive and record this information on the inspection form.

10.5 Prior to installation, the inspector shall verify any construction detail on the inspection documents that will not be visible after the firestop installation and record this information on the inspection form.

10.6 The inspector shall not supervise or in any manner direct any aspect of the installation process. This includes, but is not limited to, the following:

10.6.1 Handling and storage of materials,

10.6.2 The mixing of materials,

10.6.3 The cutting or fastening of materials, and

10.6.4 The preparation of substrates.

10.7 When work is started or completed per the schedule in Section 9, the installer shall notify the inspector. Inspection of completed work shall take place within two working days from notification by the installer.

10.8 The inspector shall verify and document that the firestop systems required in the inspection documents have been installed.

10.9 The inspector shall verify that every firestop system inspected as required by 10.12.2 is in accordance with one of the documents specified in 7.4.

10.10 The inspector shall verify that every firestop system inspected as required by 10.12.2 is in accordance with the manufacturers instructions.

10.11 The inspector shall verify compliance of the firestop system by observing the installation process and by taking and recording measurements of the substrates and materials being installed or by destructive examination of completed installations.

10.12 Inspection frequency shall depend on the method of inspection and the scope of the project. The method of inspection shall be one of the following:

10.12.1 The inspector shall be on site during installation and randomly witness a minimum of 10 % of each type of firestop system being installed, or

10.12.2 The inspector shall conduct a post installation inspection, which shall require destructive type verification of the firestop system and repair of the firestop system. A minimum of 2 %, but not less than one, of each type of firestop system shall be inspected per floor or for each area of a floor when a floor is larger than 10 000 ft^2 (946.7 m^2). An area consists of 10 000 ft^2 or less.

NOTE 4—The AA may determine the types of firestop systems and subsequently the number of each type that is to be inspected, in addition to the minimum required by this standard. The determination of a "type" will typically be a function of a unique combination of parameters, including penetrant type (for example, metal pipe, plastic pipe, cabling), firestop material or device (for example, intumescent caulk, collar, sealant), and penetrated substrate (for example, gypsum wall, concrete floor, composite floor deck).

10.13 Any type of firestop system noted in 10.12.2 that does not comply with the inspection documents will require repair or replacement and re-inspection of that firestop system plus one full additional inspection, of the number specified in 10.12.2, of that type firestop system. If non-compliance occurs on 10 % or more of the quantity of firestop products or firestop systems within 10.12.1 or 10.12.2, then inspection of those particular type firestop systems shall cease. The installer shall inspect their own work, repair or replace those like firestops within the area prior to re-commencement of inspections by the inspector.

10.14 All observed deficiencies shall be documented and marked on the inspection forms. In addition, the inspector shall physically identify the location where a required firestop system has been omitted or where the inspection results indicate that the installed firestop system does not comply with the inspection documents.

10.15 Prior to installation, the installer and inspector are to establish a communication method and minimum notice time of deficiency or deficiencies of installation after inspection.

10.16 Repair of firestops damaged during inspection shall be conducted according to the manufacturers recommended procedures and methods. The repaired firestop product that was damaged shall comply with the inspection documents.

10.17 When repairs have been made to firestop systems with documented deficiencies, the installer shall notify the inspector. Follow up inspections of firestop systems with repaired deficiencies shall take place within two working days from notification by the installer. The repaired firestop system that contained deficiencies shall comply with the inspection documents.

10.18 Inspection forms, as defined in 3.2.6, shall be submitted to the AA and installer within one working day after an area is inspected.

11. Inspection Forms

11.1 Inspection forms, as defined in 3.2.6, shall be submitted to the AA and installer within one working day after an area is inspected.

NOTE 5—The delivery of inspection reports in a timely manner helps to ensure that project construction schedules are not delayed and that the installer has an adequate opportunity to repair all deficiencies prior to the work of other trades (for example, installation of gypsum wallboard, ceilings, ductwork, and so forth) impairing or obstructing proper installation.

11.2 An inspection form shall be written, and clearly describe the results of the inspection and any deficiencies.

11.3 Example of inspection form is shown in Fig. 1.

11.4 Inspection forms shall be sequentially numbered, starting with *1*, and only contain information about one type of firestop system. Use a new inspection form for each type of firestop system. Use as many inspection forms as needed. Attach drawings and additional pages if needed.

INSPECTION FORM	Reference No. _____
Inspection Date: _____	Inspector: _____
Installer: _____	AA: _____
AHJ: _____	Project: _____
Firestop Type per Inspection Documents: _____	
Quantity of Firestop Type on Project: _____	Quantity Inspected Today: _____
Total Quantity Inspected to Date: _____	
Inspected Firestops	
Location & Inspection Document Reference	Deficiency
Repaired Firestops	
Location & Inspection Form Reference	Compliant "Yes" If "No" State Deficiency

FIG. 1 Inspection Form