



Standard Practice for On-Site Inspection of Installed Fire Stops¹

This standard is issued under the fixed designation E 2174; 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 fire stops, including methods for field verification and inspection.

1.2 This practice addresses all types of fire stops installed through or into fire resistive assemblies.

NOTE 1—Fire stop is defined in E 814.

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

1.4 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

1.5 *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.*

2. Referenced Documents

2.1 ASTM Standards:²

E 176 Terminology of Fire Standards

E 631 Terminology of Building Constructions

E 699 Criteria for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating Building Components

E 814 Test Method for Fire Tests of Through-Penetration Fire Stops

2.2 Other Standards:³

UL 1479-94 Fire Tests of Through-Penetration Fire Stops

2.3 Other Documents:⁴

International Building Code

3. Terminology

3.1 *Definitions*—Terms defined in Terminology E 631, Terminology E 176, and Criteria E 699 will prevail for terms not defined in this document.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *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.

NOTE 2—Examples of the AA include the responsible architect, engineer, building owner, or their representative.

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

3.2.4 *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.

NOTE 3—The approved fire stop submittal should have sufficient details including the fire stop manufacturer's product data, a design listing of the tested fire stop 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.

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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), Corporate Progress, 333 Pfingsten Rd., Northbrook, IL 60062.

⁴ Available from the International Code Council (ICC), 5203 Leesburg Pike, Suite 708, Falls Church, VA 22401.

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*—Manufacturers or an accredited testing laboratory should only issue judgments based on engineering principles or available testing that approximates the condition encountered, or both.

NOTE 4—The judgment is commonly referred to as an “engineering judgment” in the fire stopping industry. It should be noted that these judgments are not always issued by engineers.

NOTE 5—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. Accredited testing laboratories can verify judgments by manufacturers for validity.

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 fire stops subject to the inspection procedures outlined in this practice.

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

4.4 This practice provides a standard inspection form that is to be used when inspecting fire stops.

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 fire stops.

5.2 This practice is intended to provide a means to verify compliance of the installed fire stops 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 fire stops.

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 E 699 for agencies involved in quality assurance, or

6.1.2 Have a minimum of 2 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 10 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 fire stop, 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 fire stop system 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 fire stopping have been tested in accordance with E 814 or UL 1479, and are Listed and Labeled for the use intended.

NOTE 6—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 fire stop 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 fire stops shall have been tested or evaluated as part of the system in accordance with E 814 or UL 1479 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 fire stop 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 1 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 fire stops.

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 fire stop 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 fire stop installation and record this information on the inspection form.

NOTE 7—The following are some examples of construction details that may not be visible after the installation process: the rated floor assembly thickness, the annular space, and the wall construction.

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 2 working days from notification by the installer.

10.8 The inspector shall verify and document that all of the fire stops required in the inspection documents have been installed.

10.9 The inspector shall verify that every fire stop 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 fire stop inspected as required by 10.12.2 is in accordance with the manufacturers instructions.

10.11 The inspector shall verify compliance of the fire stop 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 fire stop being installed, or

10.12.2 The inspector shall conduct a post installation inspection, which shall require destructive type verification of the fire stop and repair of the fire stop. A minimum of 2 %, but not less than one, of each type of fire stop shall be inspected per floor or for each area of a floor when a floor is larger than 10 000 ft² (946.7 m²). An area consists of 10 000 ft² or less.

NOTE 8—The AA should determine the types of fire stops and subsequently the number of each type that is to be inspected. 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), fire stop 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 fire stop noted in 10.12.2 that does not comply with the inspection documents will require repair or replacement and re-inspection of that fire stop plus one full additional inspection, of the number specified in 10.12.2, of that type fire stop. If non-compliance occurs on 10 % or more of the quantity of like fire stops within 10.12.1 or 10.12.2, then inspection of those particular type fire stops shall cease. The installer shall inspect their own work, repair or replace those like fire stops 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 fire stop has been omitted or where the inspection results indicate that the installed fire stop does not comply with the inspection documents.

10.15 The inspector shall advise the contractor of any deficiencies noted within 1 working day.

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

10.17 When repairs have been made to fire stops with documented deficiencies, the installer shall notify the inspector. Follow up inspections of fire stops with repaired deficiencies should take place within 2 working days from notification by the installer. The repaired fire stop 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 1 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 1 working day after an area is inspected.

NOTE 9—The delivery of inspection reports should be performed in a timely manner 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 fire stop. Use a new inspection form for each type of fire stop. Use as many inspection forms as needed. Attach drawings and additional pages if needed.

11.5 When deficiencies or repairs are made to a fire stop, the inspection form number should be cited on the inspection form in **11.4** for cross reference.

12. Report

12.1 At the end of the installation and inspection process, the inspector shall submit a final report.

12.2 The final report shall contain a cover page with the following:

12.2.1 The project name, location and reference number.

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

FIG. 1 Inspection Form

12.2.2 The name and address of the inspector.

12.2.3 The name and address of the installer, as well as the prime contractor if different.

12.2.4 The name and address of the AA.

12.2.5 The name and address of the AHJ.

12.3 The final report shall also contain a summary page with the following:

12.3.1 Types and quantity of each fire stop on the project according to the inspection documents.

12.3.2 Which verification method from 10.12 was used to ascertain compliance with the inspection documents.

12.3.3 The quantity of each fire stop inspected on the project and a notarized written statement by the inspector that the number of fire stops inspected comply with 10.12.

12.3.4 The summary page should also contain percentages of deficiencies for each type of fire stop referenced in the inspection documents.

12.3.5 A total number of deficiencies should be expressed as a percentage of the total number of fire stops inspected.

12.4 The final report shall also contain copies of all information submitted by the inspector to the AA.

12.5 The final report shall also contain copies of all inspection forms submitted during the inspection process. They shall be arranged chronologically.

13. Keywords

13.1 fire stop; inspection; inspector

APPENDIX

(Nonmandatory Information)

X1.

X1.1 Inspector

X1.1.1 The inspector is responsible for the verification and inspection of all the fire stops on the inspection documents.

X1.1.2 Therefore it may be desirable that in addition to meeting the requirements set forth in this practice that the inspector is also one of the following:

X1.1.2.1 A code official.

X1.1.2.2 An architect.

X1.1.2.3 An engineer.

X1.1.2.4 A representative of a quality assurance agency or an accredited testing laboratory.

X1.1.2.5 A licensed professional in the construction industry.

X1.2 The procedures discussed in this practice should be established at a mandatory pre-construction meeting attended by representatives of the owner, general contractor, the subcontractors responsible for creating penetrations or openings, the fire stop installer and the inspector.

X1.3 In order to facilitate cooperation between all parties during the installation and inspection of the fire stops, the AA should make the following documents available: project specifications, drawings, penetration schedule and the approved fire stop submittals. Project drawings should include, but not be limited to, architectural, structural, mechanical, plumbing, electrical and fire protection. These drawings and the penetration schedule should be sufficient for identifying and locating all fire resistance rated assemblies on the project, as well as the penetrating items, and openings relative to the construction trades involved (mechanical, plumbing, masonry, etc.).

X1.4 Normally a current design listing of a fire stop generated by an approved quality assurance agency should be deemed to be adequate information for reference in contracts, specifications, drawings, submittals and reports. Published fire stop design listings shall be used if available. Judgments

should be from manufacturers or accredited testing laboratories and acceptable to the AHJ.

NOTE X1.1—Examples of listing and testing agencies that produce design listings are Factory Mutual, Omega Point Laboratories, Underwriters Laboratories, Underwriters Laboratories of Canada and Warnock Hersey/Intertek Testing Services.

X1.5 Prior to the establishment of the inspection documents, the fire stop installer should make a submittal to the AA. The name of the fire stop product manufacturer, a description of the products and systems that will be installed, and the manufacturer's installation instructions should be submitted for approval by the AA.

X1.6 The inspector should use the following as a guide during inspections:

X1.6.1 The inspector should bring any tools needed to examine the fire stop for compliance. These tools may include the following:

X1.6.1.1 A razor knife to cut into the fire stop,

X1.6.1.2 A tape measure to verify dimensions,

X1.6.1.3 A thickness gauge to verify sealant thickness, and

X1.6.1.4 An outside caliper to measure penetrating item diameters.

X1.6.2 The following are some types of penetrating items that may be encountered by the installer and inspector:

X1.6.2.1 Plastic Pipe.

X1.6.2.2 Cables.

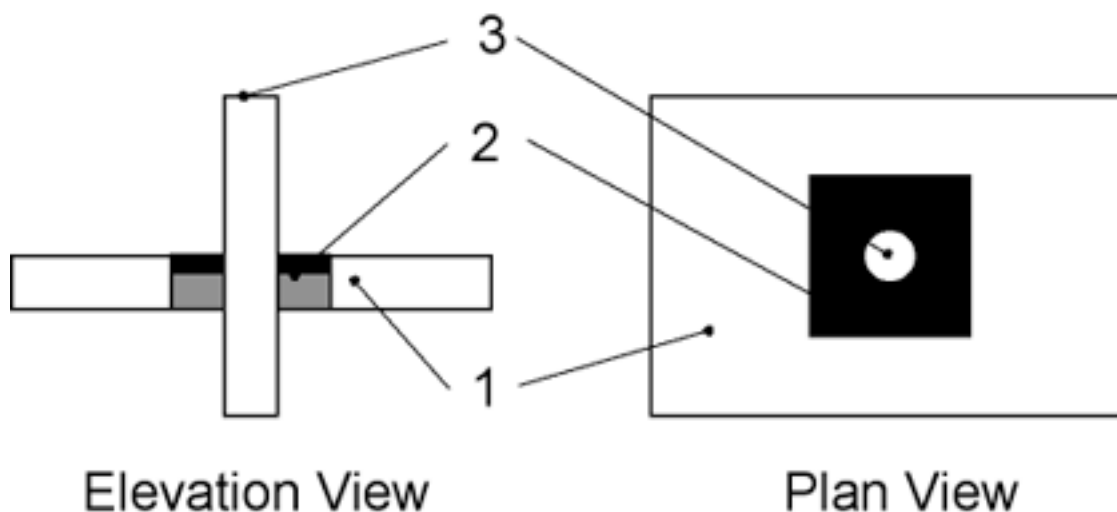
X1.6.2.3 Metal Pipe.

X1.6.2.4 Cable Trays.

X1.6.2.5 Ducts.

X1.6.2.6 Multiple items.

X1.6.3 The thickness and construction of the fire rated assembly into which the fire stop is installed is also critical.



Typical Floor Fire Stop

FIG. X1.1 Typical Floor Fire Stop

X1.7 Examples of Fire Stops

X1.7.1 Item 1 is the fire-resistive assembly. The thickness and construction may be critical to performance.

X1.7.2 Item 2 is the materials placed into an annular space. The thickness of the sealant may be critical, as well as the

thickness and density of the backing material. The shape of the annular space is typically rectangular or circular.

X1.7.3 Item 3 is the penetrating item. The material and diameter are critical components.

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