

# UL Solutions Technical Evaluation Developer Program Requirements for the Firestop Industry

**Version 1.0**

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## 1.0 Introduction

- 1.1 Manufacturers should have a master schedule for testing all their products. When a product will be used in a common configuration, such as an on-site installation, test evidence must be available to support its safety for that use. Technical evaluations should be used only when the supporting test evidence does not cover a variation of the common use and it is not practical or possible to test the variation.
- 1.2 Manufacturers who participate in this program are expected to be ethical in their use of technical evaluations. They are not allowed to use technical assessments to avoid reasonable testing requirements.
- 1.3 The UL Solutions Technical Evaluation Developer program was created for the purpose of improving the quality of manufacturer-produced technical evaluations in the firestop industry by employing a management-system approach. Technical evaluations are also commonly called engineering judgments, or simply EJs. They demand an analytical approach that often utilizes engineering experience and principles to address challenges stemming from conditions that deviate from original fire tests. Technical evaluations are commonly used to satisfy the provisions of most codes and regulations that permit alternative materials, design, and methods of construction, and equipment based on equivalency. They thus enable manufacturers to make engineering compliance decisions about whether a change in the materials or methods of construction in a tested system and product is likely to maintain the previous fire test result. In our Technical Evaluation Developer program, we will use the term “technical evaluation” instead of “engineering judgment” because technical evaluations may not always be reviewed and approved by a licensed professional engineer.
- 1.4 To qualify for the Technical Evaluation Developer program, a manufacturer shall employ at least one manufacturer’s authorized representative (MAR) who successfully demonstrates their competency to UL Solutions. The organization shall establish, effectively implement and maintain a management system focused on the process of creating quality technical evaluations. The manufacturer must be an applicant on a certification with UL within the product types described in this document.
- 1.5 The management system approach requires the manufacturer to review customer requirements and establish, utilize and maintain controlled processes in the development and creation of technical evaluations for systems and products related to the firestop industry, such as penetrations, construction joints, perimeter fire containments, fire-rated kitchen grease exhaust ducts, fire-rated HVAC ducts and fuel line protection, with the intention of meeting customer requirements.
- 1.6 The manufacturer’s customers require technical evaluation documents that satisfy their needs, expectations and construction documents. Situations requiring the use of a technical evaluation will rely upon the final approval by the Authority Having Jurisdiction (AHJ). In all cases, the AHJ ultimately determines the acceptability of the installation.
- 1.7 Because the ability of the manufacturer to create and issue a technical evaluation relies on staff knowledge, the UL Solutions Technical Evaluation Developer program requires at least one individual employed by the manufacturer to be designated a manufacturer’s technical representative (MAR) who has demonstrated their knowledge via examination and meets other related requirements defined in this document. All individuals employed by the manufacturer who carry the responsibility of developing technical evaluations are required to be tested and evaluated in accordance with the schedule defined in this document.

## 2.0 Scope

- 2.1 This document outlines the requirements for participation in the UL Solutions Technical Evaluation Developer program.
- 2.2 The program is applicable in all geographic regions subject to the correct application of standards relevant to the respective building codes for the project under consideration. Guidance on the suitability of technical assessments may also be included in relevant regional documents that outline functional fire performance requirements for construction products. It is anticipated that this guidance will be adhered to by all participating manufacturers.

## 3.0 Definitions

- 3.1 **Authority Having Jurisdiction (AHJ)** – The organization, office or individual responsible for approving or accepting fire protection/containment systems, including technical evaluations. This is typically the building code official, plan reviewer or other approved representative of the municipality who may also be the final authority signing the certificate of occupancy permit.
- 3.2 **Client Test Data program (CTDP)** – A UL Data Acceptance Program that permits clients to conduct testing at a client-owned test facility in conjunction with ongoing laboratory audits.
- 3.3 **Continuing Education Unit (CEU)** – For awarding CEU credit under the U.S. system, the International Association of Continuing Education and Training (IACET) definition will be used as follows: 1 CEU is equal to 10 contact hours of participation in an organized continuing education experience under responsible sponsorship, capable direction and certified instruction. In determining the acceptability of CEUs, UL Solutions Knowledge Solutions staff will assess total number of contact hours, sponsoring organization and applicability of training content. Similar systems exist in other geographic regions, and where the U.S. approach is applicable, it will be adopted in a similar manner.
- 3.4 **Contingency plan** – A documented plan developed by the manufacturer that details the actions to be taken for continued compliance with program requirements in the event the MAR ceases employment with the manufacturer or is unable to perform their duties.
- 3.5 **Corrective action** – Action to eliminate the cause of a detected nonconformity or other undesirable situation.
- 3.6 **Firestop system** – A combination of classified materials and products used to prevent the spread of heat, fire, gases or smoke through an opening in a wall or floor for a prescribed period. The firestop system refers to all necessary components in the approved firestop design, which can include, but is not limited to, the penetrant's size, annular space, sealant depth, etc.
- 3.7 **IFC** – International Firestop Council, an industry association consisting of manufacturers, distributors, installers, inspectors and other stakeholders with experience in working with various passive fire protection systems focusing on preventing the passage of fire and smoke within buildings. The association is involved in the research and development of codes and standards pertaining to fire and smoke containment in structures.
- 3.8 **Knowledgeable individual** – An individual who has been assessed to be technically competent in one or more fields of firestopping as indicated by a test score of 80% or higher on the UL Solutions Technical Evaluation Developer Program Exam and has the education or industry experience specified in this document.
- 3.9 **Listed** – Equipment, materials or products included in a publicly available list published by an organization concerned with evaluation of products and acceptable to the building official, that maintains periodic inspection and/or evaluation of production of listed equipment, materials or products and whose listing states either that the equipment, material or product meets identified standards (ASTM, UL Solutions, etc.) or has been tested and found suitable for a specified purpose.
- 3.10 **Management system (MS)** – Management systems to direct and control an organization with regard to quality (includes organizational structure, responsibilities, procedures, processes, and resources).
- 3.11 **Management system manual** – Document specifying the audit report of the manufacturer.
- 3.12 **Manufacturer** – A firm or organization eligible for and applying to the UL Solutions Technical Evaluation Developer program or a manufacturer of the listed material referenced in the technical evaluation to provide a solution for a specific installation.
- 3.13 **Manufacturer's Authorized Representative (MAR)** – The employee of the Technical Evaluation Developer program participant who is charged with maintaining the relationship between the participant and UL Solutions for all day-to-day business matters.

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- 3.14 **Manufacturer's representative** – An individual employed by the UL Solutions Technical Evaluation program manufacturer who is designated as an MAR by the manufacturer and who is determined by UL Solutions to meet the program requirements defined in this document.
- 3.15 **Nonconformity** – Nonfulfillment of a requirement, including any issue identified and documented by the UL Solutions auditor during the audit process that reflects deviation from the program requirements.
- 3.16 **Preventive action** – Action to eliminate the cause of a potential nonconformity or other undesirable potential situation.
- 3.17 **Program requirements** – The requirements described in this document.
- 3.18 **Qualified developers certificate**
  - 3.18.1 **Manufacturer organization certificate** – A document issued to the manufacturer after an audit has been completed and conformance to all program requirements has been determined to have been met. This certificate is issued to recognize the manufacturer's participation in the Technical Evaluation Developer program and is valid until December 31 of the year following the date of issuance. It may be canceled or withdrawn by UL Solutions at any time.
- 3.19 **Specifier firm** – The party responsible for development, issuance and control of the firestop system specification for the structure or building.
- 3.20 **Technical evaluation** – Engineering compliance decision made by a manufacturer about whether a change in the materials or methods of construction will likely maintain the fire test result. The proposed alternative methods are intended to ensure that the performance of the firestop system is not compromised when field conditions do not match the original design or unanticipated construction issues prevent installation of the listed system. Also commonly known as an engineering judgment by the firestop industry.
- 3.21 **Technical evaluation developer** – An individual employed by the manufacturer who is responsible for the creation of technical evaluations relative to this program.
- 3.22 **UL Solutions auditor** – An individual designated by UL Solutions to conduct the manufacturer audit in accordance with the program requirements.
- 3.23 **UL Solutions Fire Resistance Rated Design** – A UL Solutions Classified firestop system as defined in UL Product iQ and related to the relevant U.S. test standards.
- 3.24 **UL Solutions Fire Resistance Rated Design** – A UL Solutions firestop system as defined in UL Solutions List of Equipment and Materials – Firestop Systems and related to the relevant Canadian test standards.
- 3.25 **UL Solutions – EU Fire Resistance Rated System** – A UL Solutions EU certified firestop system as defined in Product iQ and related to the relevant European test standards.
- 3.26 **UL Solutions – AU Fire Resistance Rated System** – A UL Solutions-AU Certified firestop system as defined in Product iQ and related to the relevant Australian/New Zealand test standards.
- 3.27 **Witness Test Data program** – A UL Solutions Data Acceptance program in which testing is conducted at a third-party laboratory under UL Solutions supervision.

## 4.0 Applicable Documents

- 4.1 **ISO/IEC 17021 – Conformity Assessment** – Requirements for bodies providing audit and certification of management systems.
- 4.2 **Recommended IFC Guidelines for Evaluating Firestop Systems in Technical Evaluations** – Industry guidelines for the creation of technical evaluations rendered by companies: [IFC Guidelines](#).
- 4.3 **Passive Fire Protection Federation (PFPF)** – Guide to undertaking technical assessments of fire performance of construction products based on fire test evidence. A copy can be obtained from the Fire Sector Federation’s website: [Fire Sector Federation: Fire Safety Guidance and Advice](#).

## 5.0 General

- 5.1 **The firestop industry**
- 5.2 The firestop industry is a subset of the building industry that serves residential, institutional, commercial and industrial structures. The industry addresses the common need to limit the hazardous spread and damaging effects of fire. Firestopping involves returning the wall and/or floor to its original fire and smoke rating before a joint, gap or penetration was made during construction or to complete the rating with the installation of a joint system that joins assemblies while maintaining the rating. Within the firestop industry are specialized segments including perimeter fire containment which addresses protection of facades and breaches between facades and the floor slab and duct wrap providers who make insulation materials designed to protect surrounding walls and structures from air moving through various types of building ducts. Firestop manufacturers carefully develop products intended to establish a protective system for a joint, gap or penetration within a structure to comply with construction documents.

## 6.0 UL Solutions Technical Evaluation Developer program

- 6.1 The UL Solutions Technical Evaluation Developer program offers this industry independent, third-party audit services for the following:
  - 6.1.1 Acknowledgment of an MAR who has met program requirements and passed a written exam that tests knowledge of the use of various types of firestopping products, industry guidelines, test standards and familiarity of matching firestopping systems for the correct applications. The MAR has extensive knowledge of the UL Solutions program requirements and the IFC guidelines for creating technical evaluations. See appendices to this document for a list of reference documents pertinent to the development of technical evaluations.
  - 6.1.2 Examination of manufacturer’s established audit report and an on-site or remote audit (type to be determined by the UL Solutions field engineering staff) to determine conformance in accordance with program requirements.
  - 6.1.3 UL Solutions Technical Evaluation Developer program requirements are based on the requirements of ISO/IEC 17021:2015; conformity assessment requirements for bodies providing audit and certification of management systems.
  - 6.1.4 The systems audited under this program provide an integrated approach (demonstrated knowledge and audit report) to controlling the process in addressing customer and other applicable requirements for the creation of the requested judgments.
  - 6.1.5 Upon completion of the UL Solutions Technical Evaluation Developer Program Examination, the manufacturer is issued a Letter of Completion stating an explanation that all program requirements, including the successful completion of the initial qualification audit, must be met before the manufacturer will be issued a certificate.

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- 6.1.6 Upon completion of the audit of the manufacturer's management system, UL Solutions will provide the manufacturer with an audit report within a mutually agreed time that includes audit findings and conclusions, any identified non-conformities still remaining and eligibility for a certificate.
- 6.1.7 Upon a determination that the manufacturer has met the program requirements, the manufacturer will be issued a certificate. Certificates expire on December 31 of the following year and may be canceled or withdrawn by UL Solutions at any time. To remain current, the manufacturer will be subject to a full and complete re-audit. The re-audit will include a comprehensive audit of the manufacturer's audit report within the following calendar year. The purpose of the re-audit is to determine if the manufacturer, their MAR and their audit report comply with all aspects of the program requirements.
- 6.1.8 Upon determination that the manufacturer has met requirements:
- 6.1.9 The manufacturer's name and contact information will be published in the UL Solutions directory as a participant in the UL Solutions Technical Evaluation Developer program.
- 6.1.10 The manufacturer's organization will be issued a Letter of Participation to acknowledge active enrollment in the UL Solutions Technical Evaluation Developer program.
- 6.1.11 The general public, firestop contractors, architects, building owners, insurance agencies and any other interested parties can view companies participating in the UL Solutions Technical Evaluation Developer program in the UL Solutions internet directory at [Productiq.ul.com](http://Productiq.ul.com).
- 7.1 The manufacturer must employ at least one MAR in accordance with the program requirements.
- 7.2 The manufacturer must have an established and documented audit report in accordance with the program requirements. If an audit report has not been implemented, a provisional six-month certificate may be issued upon completion of a preliminary audit of the manufacturer's proposed program. The program must be ready to be implemented for the preliminary audit to be scheduled.

## 8.0 Application Process

- 8.1 Applications for the Technical Evaluation Developer program are obtained online at [UL.com/services/technical-evaluation-developer-program](http://UL.com/services/technical-evaluation-developer-program). Once a completed application is received and reviewed, agreement forms follow.
- 8.2 Agreement forms reference and require compliance with this UL Solutions Technical Evaluation Developer program requirements document. Agreement forms are signed by the manufacturer's authorized responsible party. Once the application and agreement has been received, reviewed and deemed acceptable, an acknowledgment letter and quotation are sent to the manufacturer.
- 8.3 Upon acceptance of the quotation, arrangements are made to conduct audit activities as defined in the program requirements.

## 7.0 Program Eligibility and Enrollment



## 9.0 Client Representative and Examination

### 9.1 Client representative

- 9.1.1 Each manufacturer under this program shall have at least one MAR who is employed by the manufacturer, meets the program requirements and has the following responsibilities:
  - 9.1.2 Defined and documented responsibility for oversight and maintenance of the manufacturer's audit report in accordance with program requirements.
  - 9.1.3 Defined and documented responsibility for training staff. The individual also ensures that the technical evaluation writing staff has received any required training or obtained the qualifications necessary to achieve the competency required by the client. The MAR has the responsibility to act as a resource to staff as one of the manufacturer's designated experts to assist with resolving questions.
  - 9.1.4 In the event that the MAR is no longer employed by the manufacturer or is otherwise unable to fulfill the duties of the role, the manufacturer shall carry out the following to remain in the program:
    - 9.1.5 Immediately notify UL Solutions.
    - 9.1.6 Immediately initiate the contingency plan for continued compliance with program requirements.
    - 9.1.7 Qualify a replacement MAR within 120 days.
- 9.2 In cases where an individual moves from one company to another, the existing knowledge and competence of the individual may be transferred to the new company, but knowledge of the specific technical aspects of the new company's products must be demonstrated before the person can act as the MAR at the new company.

## 10.0 Demonstrated knowledge

10.1 Demonstrated knowledge is established by completion of the UL Solutions written examination with a score of 80% or better. Demonstrated knowledge shall be established by all staff, including the MAR, who carry the responsibility of developing technical evaluations.

### 10.2 Examination procedures

10.2.1 The UL Solutions Technical Evaluation Developer examination will be administered by UL Solutions LLC at designated locations and times or through online tools available through [ultraining.myabsorb.com/#/online-courses/69ad0a6d-1c93-475a-8bdd-6b4c97e21a26](http://ultraining.myabsorb.com/#/online-courses/69ad0a6d-1c93-475a-8bdd-6b4c97e21a26).

10.2.2 To be eligible for the examination, an individual must be an active employee of a manufacturer and carry the responsibility of developing technical evaluations that are subject to review under the UL Solutions Technical Evaluation Developer program working within the UL Solutions Technical Evaluation Developer program. All eligible employees carrying this responsibility must complete a UL Solutions Technical Evaluation Developer examination application. Completed examination forms may be submitted to UL Solutions to request testing. Examination fees must be included at the time of application submittal.

10.2.3 Upon successful completion of the exam with a score of 80% or better, the manufacturer's employee is issued a letter of completion by UL Solutions Knowledge Solutions.

### 10.3 Qualification period

10.3.1 Individuals who successfully complete the UL Solutions Technical Evaluation Developer examination are qualified for a period of three years from the date of certification.

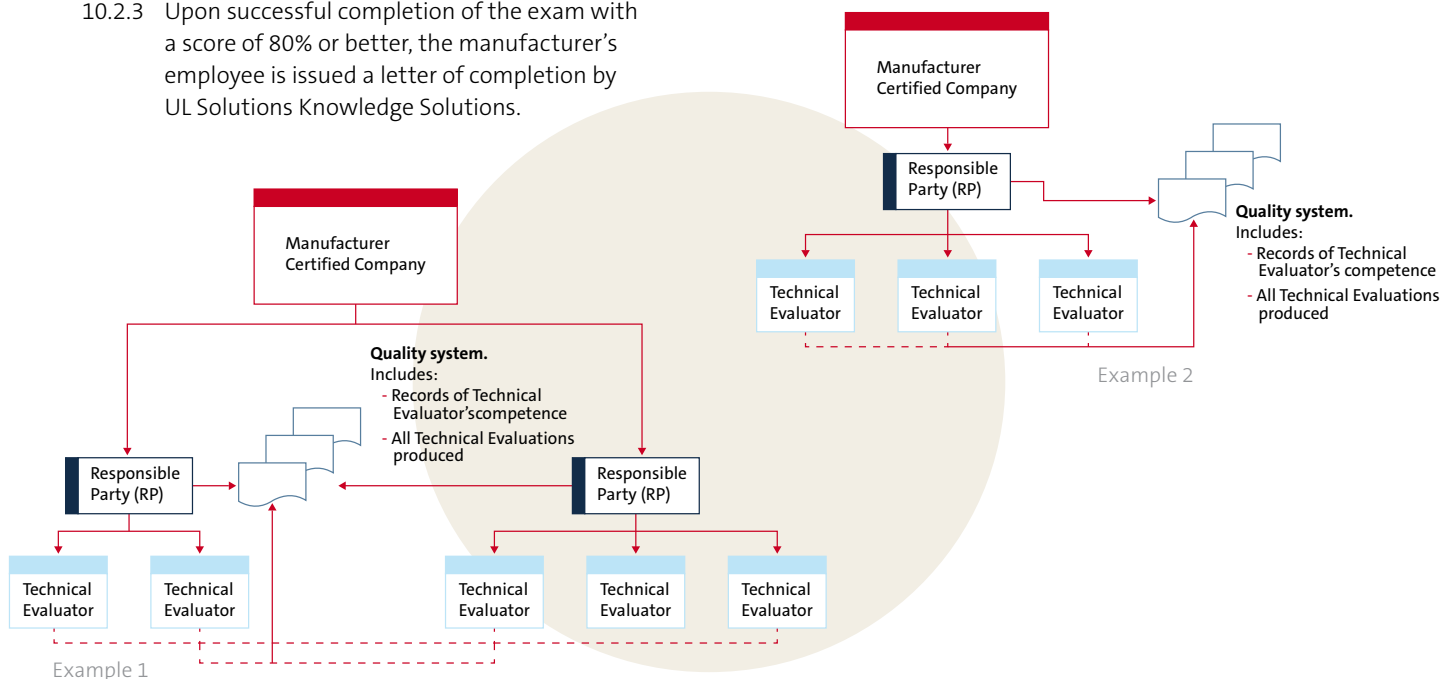
10.3.2 To maintain qualification, the manufacturer employee must renew prior to the expiration date of the certification period. Recertification may be accomplished by submitting CEUs or similar credits to UL Solutions Knowledge Solutions or through reexamination. Failure to obtain the required number of CEUs or complete the reexamination prior to the end of the certification period will result in decertification, which may impact the UL Solutions Technical Evaluation Developer status.

### 10.4 Continuing education

10.4.1 As specified in Appendix F.

### 10.5 Organization examples

10.5.1 There is no required structure for how the organization should be organized, but two typical examples are given below. These are not definitive:



## 11.0 Audit of Evaluation-Issuing Company's Management System

- 11.1 **Audit overview** – The manufacturer shall work directly with the assigned UL Solutions auditor for scheduling and conduct of audits. An audit will be conducted of the manufacturer's management system at the manufacturer's facility. Prior to the audit, the UL Solutions auditor will contact the manufacturer to obtain a copy of the manufacturer's audit report (MS) manual. The UL Solutions auditor will review the MS manual in advance of the initial audit to become familiar with the manufacturer's MS, identify any potential areas of nonconformity with program requirements, and determine readiness for the facility audit. The UL Solutions auditor will discuss potential nonconformities, resolve any known differences in understanding, and determine a mutually acceptable schedule for the audit. The auditing activity will be conducted in accordance with UL Solutions Document 00-BL-S0404.
- 11.2 **On-site contact** – The MAR must be available at the agreed time of audit and must have a thorough working knowledge of the company's audit report (systems, processes and procedures) as well as a working knowledge of the program requirements. Likewise, the MAR shall have full authorization to act on behalf of the manufacturer with regard to issues falling within the scope of the program.
- 11.3 **Audit participation** – The manufacturer shall actively participate and assist the UL Solutions auditor as necessary in the review of the manufacturer's audit report and documentation relating to compliance with the program requirements.
- 11.4 **Nonconformity** – Nonconformities to UL Solutions program requirements or the manufacturer's management system requirements discovered during the audit will be documented and provided to the manufacturer. The manufacturer shall provide a written corrective action plan (addressing the nonconformity issues) to the UL Solutions auditor within 30 days. If a corrective action plan is not received within 30 days of the audit conclusion, another complete audit may be deemed necessary. Renewal of program participation cannot occur without receipt and acceptance by UL Solutions of the corrective action plan.
- 11.5 The use of the term "engineering judgment" in a program participant's manual, documentation or record keeping is not considered a nonconformity and is permitted.
- 11.6 Nonconformities can be grouped into two categories as follows:
- 11.6.1 **Minor** – A nonconformance that the UL Solutions auditor determines is not likely to:
- 11.6.1.1 Result in the failure of the MS, or
  - 11.6.1.2 Reduce its ability to assure controlled processes, or
  - 11.6.1.3 Involve the shipment or installation of material
- 11.6.2 **Major** – A nonconformance that represents:
- 11.6.2.1 The absence or total breakdown of an MS or element thereof required to meet the applicable requirements; several minor nonconformities with one requirement that, when combined, can represent a total breakdown of the system and thus be considered a major nonconformance
  - 11.6.2.2 The shipment or installation of a nonconforming product or system, which can result in immediate suspension from the program
  - 11.6.2.3 Presents a potential safety risk
  - 11.6.2.4 A nonconformance that judgment and experience indicate is likely either to result in the failure of the MS or to reduce its ability to assure controlled processes, products and systems

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- 11.7 **Corrective action** – The manufacturer shall thoroughly and accurately address all documented nonconformity issues. Corrective action plans shall be communicated in writing directly to the assigned UL Solutions auditor. The manufacturer shall assist the UL Solutions auditor to substantiate if corrective actions to resolve nonconformity items are acceptable. If major or numerous minor nonconformity items are discovered, as determined by the UL Solutions auditor, a full re-audit will be required. If only a limited number of minor nonconformity items are discovered, a partial re-audit or appropriate evidence will be required. Acceptance into the program cannot be granted until all nonconformity items are resolved and verified by UL Solutions or a provisional certificate is issued after a preliminary audit. If a provisional certificate was provided, another full audit would be required to renew the certificate.

## 12.0 Manufacturer Management System Requirements

### 12.1 General

- 12.1.1 The manufacturer shall establish and effectively implement and maintain an audit report (MS) to be eligible for this program. The MS must meet requirements specified here that focus on the selection and development of quality technical evaluations that are compliant with the guidelines stated within this program. The manufacturer shall at a minimum:
- 12.1.2 Identify the processes needed for the audit report and determine the sequence and interaction of these processes
- 12.1.3 Determine that the identified processes are effective
- 12.1.4 Ensure that sufficient resources are available to support the operation and monitoring of these processes
- 12.1.5 Document the processes in writing by means of a manual that defines responsibilities and authorities, including those of the MAR
- 12.1.6 Monitor, measure and analyze to continually improve the processes
- 12.1.7 Maintain control of any outsourced processes that could affect the conformity of selection and installation of firestop systems with requirements through the above activities to the extent needed

### 12.2 Management system elements

- 12.2.1 UL Solutions requires that the manufacturer maintain the following audit report elements for consideration into the program:
- 12.2.2 Technical evaluation requirements and review processes created by the participating manufacturer
- 12.2.3 Technical oversight and quality assurance procedures within the participating manufacturer
- 12.2.4 Methodology for capturing the type of decision rendered as to product, application, end use, and how to request testing and certification from UL Solutions; entry of information into the UL Solutions Technical Evaluation Database

### 12.3 Corrective/preventive action

- 12.3.1 The manufacturer shall have a documented procedure for corrective and preventive action and use corrective action as a tool to address nonconformities and as a tool for improvement. Corrective actions should be focused on eliminating causes of nonconformities to prevent recurrence. Sources of information for corrective action should include complaints regarding fulfillment of requirements for creating technical evaluations, process and judgment nonacceptance, audit results, review of systems and products submitted for certification that did not comply with the certification standard, peer reviews, and feedback from UL Solutions staff.

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- 12.3.2 The audit report documentation shall include a procedure to define requirements for:
  - 12.3.3 Reviewing nonconformities (including test failures and complaints)
  - 12.3.4 Determining the causes of nonconformities
  - 12.3.5 Determining and implementing the actions needed to correct the nonconformity and prevent the nonconformity from recurrence
  - 12.3.6 Recording the results of actions taken
  - 12.3.7 Reviewing the effectiveness of actions taken
  - 12.3.8 Management system monitoring and improvement
  - 12.3.9 Management shall provide evidence of their commitment to the development and implementation of an audit report. This can be effectively achieved if management communicates to the importance of meeting requirements; establishes a policy and objectives related thereto; defines and communicates responsibilities and authorities within the organization; conducts management reviews; and provides adequate resources.
  - 12.3.10 The manufacturer shall continually improve the effectiveness of the audit report through the use of the inspection results, analysis of data, corrective and preventive actions, and management review. The manufacturer's MAR shall audit activities and responsibilities that are outside their direct control to ensure the audit report is effectively implemented. These audits shall be planned and take into consideration the status and importance of the activity to be audited as well as the results of previous audits. The MAR has responsibility for planning, conducting, reporting audit results and maintaining audit records. These responsibilities and requirements shall be documented.
  - 12.3.11 The manufacturer's MAR, optionally with top management, shall review the suitability, adequacy and effectiveness of the audit report at planned intervals. The inputs for management review should include management objectives; results of peer reviews; MAR audits; staff competency; customer feedback; project nonconformities; UL Solutions feedback; status of corrective and preventive actions; follow-up actions from previous management reviews; changes that could affect the audit report and recommendations for improvement. The output from management review should include decisions and actions related to improvement of the effectiveness of the audit report; improvement of processes related to fulfilling requirements; and resources. Records from management reviews shall be maintained.
- 12.4 Documentation and record keeping**
- 12.4.1 Documents required by the audit report shall be controlled. The manufacturer shall establish a documented system that includes a policy on fulfillment of requirements, a manual, procedures, work-instructions, and additional documents and records so that processes and activities are carried out as planned to meet requirements.
  - 12.4.2 The manufacturer shall have a documented system in place to define the controls required for:
    - 12.4.2.1 Approval of documents for adequacy prior to use
    - 12.4.2.2 Review and update of documents
    - 12.4.2.3 Changes and identification of revision status of documents
    - 12.4.2.4 Availability of relevant documents at points of use
    - 12.4.2.5 Legibility and document identification
    - 12.4.2.6 Documents of external origin (identification and distribution control)
    - 12.4.2.7 Prevention of unintended use of obsolete documents

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- 12.4.3 Records are a special type of document that require specific controls (identification, storage, protection, retrieval, retention, disposition). The manufacturer shall establish a documented system for the control of records.
- 12.4.4 Included in the audit report shall be a manual (or equivalent) that contains documented statements of a policy and objectives for fulfillment of requirements; procedures established for the audit report (or reference to them); documents needed by the MAR for the effective operation of the audit report; and definitions of responsibilities, including responsibilities of the MAR.
- 12.4.5 Records shall be established and maintained to provide evidence of conformity to requirements and of the effective operation of the audit report. Records shall remain legible, readily identifiable and retrievable, and shall be retained as required by code or government regulation or for a period of not less than five years. Information should be maintained electronically to allow for potential remote audits as needed by UL Solutions.
- 12.4.6 The following records shall be maintained, at a minimum:
- 12.4.6.1 Submittals requesting technical evaluations with materials, site conditions and receiving companies or authorities of record; evidence of entry into the UL Solutions Technical Evaluation Developer Database
  - 12.4.6.2 Customer feedback records, with corrective action (and preventive action as appropriate)
  - 12.4.6.3 Corrective and preventive action records
  - 12.4.6.4 Staff education, training, competency evaluations and training effectiveness
  - 12.4.6.5 MAR audits
  - 12.4.6.6 Management review records

## 13.0 Technical Evaluation Decision Requirements

- 13.1 Included in the management system records shall be a standard operating procedure for completing technical assessments. This procedure should reflect the applicable requirements outlined in Appendix C and specifically shall include the following requirements, which are applicable to all technical evaluations:
- 13.2 These technical evaluation guidelines follow the International Firestop Council's Engineering Guidelines found on the IFC website at [Firestop.org/engineering-judgment-guidelines.html](http://Firestop.org/engineering-judgment-guidelines.html).
- 13.3 A technical evaluation is not to be issued when a tested and listed system exists that addresses the firestopping requirements of the project's specific conditions being evaluated.
- 13.4 A technical evaluation shall include the project name, location and firm for which the technical evaluation is being written. It shall also be written exclusively for the specific project conditions and configurations upon which the technical evaluation is being rendered.
- 13.5 A technical evaluation shall include the date on which the technical evaluation is issued.
- 13.6 A technical evaluation shall reference a technical evaluation reference number. The reference number is created by and specific to the protocol outlined in the manufacturer's quality manual. This number provides traceability for logging technical evaluations into a company's electronic database and for referencing the technical evaluation through the UL Solutions Technical Evaluation Developer program.

## PROGRAM REQUIREMENTS

- 13.7 The technical evaluation shall be written on the issuing company's letterhead or utilize a drawing with the company's specific letterhead.
- 13.8 The technical evaluation must reference the specific project drawings provided for the review. The referenced drawings must be retained as part of the technical evaluation folder for the issued judgment.
- 13.9 If the document is revised or re-issued, version control shall be included on the issued document. A revised or re-issued date is to be included on the technical evaluation, and the revision must be recorded in the records for the original decision.
- 13.10 The basis of the firestop or system design for the technical evaluation-referenced UL Solutions tested and listed design number that is most closely representative of the condition in which the evaluation is addressing.
- 13.11 The technical evaluation shall indicate that the recommended system is a technical evaluation and not a listed system.
- 13.12 The technical evaluation shall identify and address the nonstandard conditions of the construction details being reviewed.
- 13.13 The technical evaluation shall include the anticipated hourly fire rating (type of fire rating). Example: For Integrity rating for perimeter fire containment systems.
- 13.14 The technical evaluation may include a drawing and or pictures of the site conditions. The text of the technical evaluation, including any attached drawings and or pictures, must be representative of the actual construction conditions and should outline all the design criteria. Drawings and any pictures shall be retained as part of the technical evaluation records for the issued judgment.
- 13.15 The technical evaluation shall include the title, signature and printed name of the person writing the judgment. The composer of the technical evaluation must be the MAR or one of the company's technical personnel who has qualified following the company's UL Solutions Technical Evaluation Developer program manual.
- 13.16 The technical evaluation shall reference the applicable ASTM or UL Solutions test standard that the technical evaluation addresses. The technical evaluation may reference as necessary additional information pertaining to clauses of the building code or regulation being enforced for the project, but these references are not mandatory.
- 13.17 Reference the Recommended IFC Guidelines for Evaluating and Writing EJ Guidelines for further guidance regarding writing technical evaluations (Guidelines available at [Firestop.org/engineering-judgement-guidelines](https://www.firestop.org/engineering-judgement-guidelines))

## 14.0 Technical Evaluation Audit Testing Process

- 14.1 **Technical decision selection for audit testing guidelines**
- 14.1.1 UL Solutions to select one decision per 1,000 decisions issued. The minimum requirement will be to conduct one test for the purpose of validating the technical decision made per year, with a maximum number of tests not to exceed 15 tests per year. Test selections will be grouped by product type; through penetration or linear joint seal, duct products or perimeter fire containment.
- 14.1.2 Testing of engineered systems will be based on the total volume of s issued in a calendar year.
- 14.1.3 Systems to be tested will be chosen by UL Solutions based on type of evaluation conducted, installation and type of product entered into the Technical Evaluation Database. UL Solutions will not conduct a technical review of systems or judgments prior to testing.

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- 14.1.4 Testing may be conducted at a UL Solutions facility, through the UL Solutions Client Test Data program (CTDP) or the UL Solutions Witness Test Data program (WTDP). CTDP or WTDP testing options are only applicable to those clients whose labs are active and in good standing with the UL Solutions Data Acceptance Program.
- 14.1.5 When testing will be conducted at a UL Solutions facility or through WTDP, the fees for testing are not included in the program charges. The testing fees related to this program's audit validation testing will be quoted at a reduced rate from normal certification pricing.
- 14.1.6 A report of the test as well as original judgment (or summary thereof) shall be submitted to UL Solutions for review when testing is not conducted at UL Solutions.
- 14.1.7 Systems that achieve passing results per year will be eligible for inclusion in Product IQ through a UL Solutions or UL Solutions-EU system for program participants.
- 14.1.8 Program participants are to complete testing within six months of notification for penetration and linear joint seal testing. For duct products and perimeter fire containment products, the program participant must have all testing conducted within 12 months of notification.

### 14.2 Appeal process

- 14.2.1 Manufacturers have the right to appeal a specific technical evaluation that has been randomly selected for testing. Possible reasons for appeal may be based on repetitive testing of similar systems already submitted to UL Solutions or other substantial technical reasons. An appeal can also be submitted if the technical evaluation involved the use of archaic construction methods or materials.
- 14.2.2 The appeal and rationale for appeal must be submitted to UL Solutions in writing by the program participant. If the appeal is granted prior to the UL Solutions annual audit, it must be formally documented.
- 14.2.3 The appeal must be submitted within 30 days of UL Solutions sending notice of the samples to be tested.
- 14.2.4 UL Solutions will render a judgment on the appeal and notify the participant of the finding. The UL Solutions judgment must be provided to the client within 30 days of the receipt of the appeal.
- 14.2.5 Should the appeal be granted by UL Solutions, UL Solutions will randomly select a different technical evaluation for testing.

### 14.3 Procedures in case of nonconforming results

- 14.3.1 Systems that do not achieve compliant results with the referenced technical decision will be subject to an escalation process. This escalation process may include referral of the product and the product use to the UL Solutions market surveillance program. The escalation process will be initiated once the client has exhausted all testing options.
- 14.3.2 Tests with identified nonconformities are required to be submitted to a second test to address the product failure. A third test is permitted only when the reason for the product failure in the second test has been identified as unrelated to the performance of the product/system/material being tested. For example, additional retesting would be permitted in cases of test equipment failure or concrete spalling.
- 14.3.3 When noncomplying results have been returned, program participants shall analyze and record any patterns or trends noticed during testing.
- 14.3.4 Multiple (XX-TBD) nonconformities of multiple technical decisions in a single calendar year could result in a manufacturer's removal from the program. The removal from the program would be at sole discretion of the UL Solutions management team. Upon documentation of multiple instances of nonconformance, the UL Solutions program manager will determine if suspension or removal of the participant is warranted.



## 15.0 Participation Letters and Re-audits

### 15.1 Letter issuance and control

- 15.1.1 Upon a determination that the manufacturer has met the UL Solutions requirements, the manufacturer will be issued a letter indicating participation in the UL Solutions program. The certificate includes, where appropriate:
- 15.1.2 Manufacturer's name and address of the location assessed under the program
- 15.1.3 Effective date (date of compliance decision) and expiration date (one year following effective date)
- 15.1.4 Unique serial number and UL Solutions file number
- 15.1.5 Name of the UL Solutions manufacturer to which was assessed
- 15.1.6 Authorized UL Solutions Technical Developer Evaluation program
- 15.1.7 Letters are issued only to those manufacturers that comply with UL Solutions program requirements and only after the nonconformities identified during UL Solutions audits have been resolved.

### 15.2 Technical Evaluation Developer certificate renewal

- 15.2.1 Certificates may be renewed annually on the renewal date indicated on the certificate. Certificates may be canceled or withdrawn by UL Solutions or the manufacturer at any time. To remain current, the manufacturer will be subject to an annual full and complete re-audit. The re-audit will include a comprehensive audit of the manufacturer's audit report. The purpose of the re-audit is to determine if the manufacturer, their MAR and their audit report remains in compliance to program requirements.

### 15.3 Technical Evaluation Developer program directory

- 15.3.1 The manufacturer's name and contact information are published on the UL Solutions online directory. The general public, building owners, architects, designers, insurance agencies and other interested parties can view Technical Evaluation Developer program manufacturers in the UL Solutions internet directory at [Productiq.ul.com](http://Productiq.ul.com) under the Authorized Service Providers heading.

## 16.0 Complaints/Right to Appeal

### 16.1 Complaints

- 16.1.1 Anyone may lodge a complaint regarding UL Solutions auditors or services. Complainants can, without prejudice, present and discuss their views with UL Solutions Customer Advocacy. Upon receipt of a formal complaint, UL Solutions Customer Advocacy shall initiate an investigation to determine the cause of the complaint.
- 16.1.2 A complaint can be made through any form of communication, such as telephone, email or letter. If a complaint is communicated orally, the complainant will be required to submit a written version for UL Solutions.
- 16.1.3 Complainants that desire to remain anonymous and do not request a response shall nevertheless be evaluated and considered for corrective actions. If a formal complaint has not been satisfactorily resolved, it may be escalated to a higher UL Solutions management level for resolution.

### 16.2 Short Notice Audits

- 16.2.1 It may be necessary to conduct audits on short notice to investigate complaints in response to manufacturer changes or for any reason deemed necessary by UL Solutions.
- 16.2.2 UL Solutions will inform the manufacturer of the visit with at least one week's notice prior to the visit and an explanation of the purpose or reason for the visit.

### 16.3 Appeals

- 16.3.1 An appeal can be submitted by a participating company when there is a disagreement with a UL Solutions decision and the dispute cannot satisfactorily be addressed. Appeals should be first addressed to the UL Solutions program manager of the Technical Evaluation Developer program to determine that all objective information was clearly understood and all questions were answered. If the dispute is not resolved by the program manager, the appeal will be formally escalated through the UL Solutions Field Engineering program manager or their designated technical resource for review of the audit process and resulting report. Further technical issues shall be forwarded after that review to the UL Solutions principal engineer responsible for the product certification category. Further issues from clients may be sent to the UL Solutions Customer Advocacy team for resolution.

## Appendix A — Review and Reexamination of Quality Manuals and Practices

### Review and Reexamination of Quality Manuals and Practices

1. The manual shall be revision controlled.  
The manufacturer's MAR shall be the document owner and maintain control of the document (could have a designated quality manager as a signatory in addition to the MAR).
2. The review process must involve input of the manufacturer's MAR, who must review and approve any suggestions by the technical evaluation staff or quality manager.
3. Interim peer audits by the manufacturer's responsible party must take place each year to review evaluations against specified process. Results must be used to identify areas where the quality manual needs further improvement or altering. Clients must select a minimum of five evaluations for audit each year. Additional evaluations are to be selected based on number of staff involved, staff competencies and subject matter involved in the evaluation. All staff, competencies and subject matter areas shall be covered by the interim peer audits.
4. The MAR shall incorporate changes to the quality manual needed to resolve any findings by the UL Solutions auditing staff where the corrective actions included revision of the quality manual.
5. The manufacturer's MAR shall encourage peer suggestions for considerations and suggestions to update the documents.
6. Revisions do not need to be submitted to UL Solutions for approval but shall be noted to the auditor at the start of the annual audit.

### Update Frequency for the Manual

1. Annual documented review is required for ongoing certification with the UL Solutions Technical Evaluation Developer program at a minimum.
2. Audits of internal staff by the MAR several times a year should be part of the quality plan to identify opportunities for quality manual improvements. Interim findings should be used to improve quality and revise the manual when needed.

### Minimum Quality Requirements

1. Document following ISO-type quality guidelines such as ISO 9001.
2. Audit records shall be maintained for all internal audits conducted by the manufacturer.
3. A documented system shall be in place to define the controls for:
  - a. Approving documents for relevance to program and comprehension of changes prior to use
  - b. Reviewing and updating documents
  - c. Changing and identifying revision status of documents
  - d. Making relevant documents available at point of use (how staff gains access to manual, standards, etc.)
  - e. Identifying documents
  - f. Identifying and distributing documents of external origin
  - g. Preventing unintended use of obsolete documents

The quality manual shall include training records; approval and competency determinations; oversight and review of judgments; methods of document keeping and tracing of judgments issued to documents submitted; and process flow for creation of judgments.

## Appendix B – Audit Guidelines and Frequency

### Audit Guidelines

1. The initial audit will be performed to verify the following:
  - a. Compliance of the management system manual with the technical evaluation program rules and regulations.
  - b. Audit review of technical evaluations performed in the previous six-month period according to the sampling schedule established below. For the initial audit only, each noncompliance will be handled by a corrective action report with no removal from the program regardless of noncompliance grade. Any noncompliance discovered will result in a follow-up audit to be scheduled within six months. If no instances of noncompliance are discovered, the follow-up audit can be scheduled within 12 months.
  
2. Audits will be announced in advance because the inspector will need to coordinate with the MAR, who will be the primary host during the audit process.
  
3. Audits will initially be scheduled once per year.
  
4. Audit process considerations:
  - a. The MAR will need to be prepared with the number of evaluations written and provide that information to UL Solutions a minimum of one week prior to the audit so the appropriate amount of time for the audit may be planned.
  - b. Other than during the initial audit, the sampling bank will consist of all evaluations written since the date of the previous audit.
  - c. The UL Solutions auditor will randomly select evaluations until at least one evaluation is chosen from each evaluation writer on the primary roster. Duplicate evaluations from any one individual are to be discarded until the full roster is represented and the required diversity of evaluations has been obtained.
  - d. In addition to those sampled during the audit, any evaluations provided to UL Solutions from any source (UL Solutions Market Surveillance, UL Solutions Field Reports or others) shall be included in the audit review and judged for compliance.
  - e. Findings will be communicated to the MAR. Any noncompliance that cannot be graded on-site will be sent to UL Solutions for internal review and grading.
  - f. All findings can be appealed by the MAR, but all appeals must be accompanied by sound engineering reasoning and explanation submitted with the corrective action response to the audit report.
  - g. All appeals will be judged by UL Solutions, and any judgment made by UL Solutions after initial review will be final.
  
5. The sampling schedule will be established as follows:

Number of evaluations written annually	Initial evaluation sample size for auditing	Evaluation sample size with 1 noncompliance discovered
1-250	3	10
251-500	4	10
501-1,000	6	20
1,001-2,000	8	20
2,001-4,000	10	30
Each additional 2,000	Add 2	30

6. A single noncompliance of any grade found during review of the initial sample for any follow-up audit will require the auditor to increase the sample size as noted in the third column of the chart above.

## Audit Program Performance Levels

A clean audit is defined as an audit that produces 10% or fewer Grade 1 nonconformities from the reviewed bank of evaluations, to include sampled evaluations and reported evaluations from other sources.

## Nonconformance Grading Scale

In the review of sampled technical evaluations, it is important to note that judgments regarding levels of concern about technical merit are not based on technical content review. Rather, concerns about technical merit shall be based on evidence of nonconformity with the audit report that raises suspicion about the technical merit of the evaluation document. With that said, if the suspicion is high enough to justify a Grade 4 nonconformance, the auditor, at their discretion, can request a more thorough review of the technical content.

**Grade 1 (minimal impact)** – Any low-level concern as it relates to the effectiveness of the audit report as evidenced by minor infractions on the technical evaluation that neither

raise questions concerning the viability of the technical evaluation nor raise suspicion of technical merit.

**Grade 2 (moderate impact)** – Any moderate-level concern as it relates to the effectiveness of the audit report as evidenced by infractions on the technical evaluation that may raise questions concerning the viability of the technical evaluation or that could raise suspicion of technical merit.

**Grade 3 (high impact)** – Any high-level concern as it relates to the effectiveness of the audit report as evidenced by infractions on the technical evaluation that raise significant questions concerning the viability of the technical evaluation and raise suspicion of technical merit.

**Grade 4 (extreme impact)** – Any extreme-level concern as it relates to the effectiveness of the audit report as evidenced by infractions on the technical evaluation that raise significant questions concerning the viability of the technical evaluation and cause suspicion of technical merit.

Examples for each grade are as follows:

Grade	Examples
1 (Minimal)	<ul style="list-style-type: none"> <li>Missing or incorrect information, such as job name, location, firm (when applicable), date issued, etc.</li> <li>Incorrect basis system reference</li> <li>Significant typographical errors that do not refer to technical features, or general unprofessional appearance</li> </ul>
2 (Moderate)	<ul style="list-style-type: none"> <li>A judgment that is inadvertently not signed off on by the MAR or other acceptable approver</li> <li>Missing basis system reference</li> <li>Missing reference to issuing company information on the evaluation detail</li> <li>Missing reference to project details when supplied</li> <li>Missing references to applicable F, T, FH, FTH, W or L ratings that are required</li> <li>Significant typographical errors that refer to technical features</li> <li>Any judgment that is issued with significant levels of Grade 1 concern</li> </ul>
3 (High)	<ul style="list-style-type: none"> <li>A technical evaluation that is not reviewed by the MAR or other acceptable approver and/or cannot be traced back to the technical evaluation writer</li> <li>Evaluation is not retrievable by the auditor during audit</li> <li>Corrective action report that remains unanswered more 6 weeks after the audit findings are delivered to the MAR</li> <li>Missing notation that this is a technical evaluation and not a listed system</li> <li>Evaluation written when a tested system exists that addresses the specific job condition</li> <li>Lack of detail about nonstandard conditions that differentiate the evaluation from the basis system</li> <li>Details evaluated by UL Solutions about the validity of the application and viability of the recommended system</li> <li>Any judgment that is issued with significant levels of Grade 2 concern</li> </ul>
4 (Extreme)	<ul style="list-style-type: none"> <li>Corrective action report that remains unanswered more than 12 weeks after the audit findings are delivered to the MAR</li> <li>Details that UL Solutions has evaluated as egregious and/or unsafe relating to the validity of the application and viability of the recommended system</li> <li>Any judgment issued with significant levels of Grade 3 concern</li> <li>An auditor's expression of extreme concern that raises significant suspicion about the technical merit of an evaluation; at the auditor's discretion, a technical evaluation with Grade 4 nonconformance can be submitted for further review</li> </ul>

**PROGRAM REQUIREMENTS**

**Process Flow for Compliance**

Compliance Level	Characteristics	Result	How to Improve
Fully Compliant	Clean audit status, no more than one Grade 1 noncompliance	Annual audit schedule	NA
Probationary Level 1	<ul style="list-style-type: none"> <li>• Single Grade 1 noncompliance rate between 10% and 50%</li> <li>• Maintain Grade 1 noncompliance between 10% and 25% over 2 or more audits</li> <li>• One Grade 2 noncompliance</li> </ul>	Semi-annual audit schedule	2 consecutive clean audits return program to Fully Compliant
Probationary Level 2	<ul style="list-style-type: none"> <li>• Single Grade 1 noncompliance rate above 50%</li> <li>• Maintain Probationary Level 1 for 3 or more audits</li> <li>• Maintain Grade 1 noncompliance between 25% and 50% over 2 or more audits</li> <li>• 20% or higher Grade 2 noncompliances</li> <li>• One Grade 3 noncompliance</li> </ul>	3-month audit schedule	<p>4 consecutive clean audits return program to Fully Compliant</p> <p>2 consecutive audits with Grade 1 noncompliance rate below 25% return program to Probationary Level 1</p>
Withdrawal	<ul style="list-style-type: none"> <li>• Maintain Grade 1 noncompliance over 50% for 2 or more audits</li> <li>• Maintain Probationary Level 2 for 3 or more audits</li> <li>• Maintain Grade 1 noncompliance between 25% and 50% over 4 or more audits.</li> <li>• 50% or higher Grade 2 noncompliances</li> <li>• 20% or higher Grade 3 noncompliances</li> <li>• One Grade 4 noncompliance</li> </ul>	Suspension from program for a minimum of 1 year	Reapply for program consideration after 1 year from the suspension date

## Appendix C – Technical Evaluation Requirements

### Requirements Applicable to All Technical Evaluations

- These technical evaluation guidelines follow the International Firestop Council's Engineering Guidelines found on the IFC website at [Firestop.org/engineering-judgment-guidelines.html](http://Firestop.org/engineering-judgment-guidelines.html).
- A technical evaluation is not to be issued when a tested and Listed system exists that addresses the firestopping requirements of the project's specific conditions being evaluated.
- A technical evaluation must include the project name, location and firm for which the technical evaluation is being written. It must also be written exclusively for the specific project conditions and configurations upon which the technical evaluation is being rendered.
- A technical evaluation is to include the date on which the technical evaluation is issued.
- A technical evaluation must include a technical evaluation reference number. The reference number is created by and specific to the protocol outlined in the manufacturer's quality manual. This number provides traceability for logging technical evaluations into a company's database and for referencing the technical evaluation through the UL Solutions Technical Evaluation Developer program.
- The technical evaluation must be written on the issuing company's letterhead or utilize a drawing with the company's specific letterhead.
- The technical evaluation must reference the specific project drawings provided for the review. The referenced drawings must be retained as part of the technical evaluation folder for the issued judgment.
- The basis of the firestop or system design for the technical evaluation- Referenced UL Solutions tested and listed design number or system that is most closely representative of the condition in which the evaluation is addressing.
- The technical evaluation must indicate that the recommended system is a technical evaluation and not a listed system.
- The technical evaluation must identify and address the nonstandard conditions of the construction details being reviewed.
- The technical evaluation must include the anticipated hourly fire rating (type of fire rating). Example: F or integrity rating for perimeter fire containment systems.
- The technical evaluation may include a drawing or photo of onsite conditions. The text of the technical evaluation, including any attached drawings, must be representative of the actual construction conditions and should outline all the design criteria. Drawing(s) must be retained as part of the technical evaluation records for the issued judgment.
- The technical evaluation must include the title, signature and printed name of the person writing the judgment. The composer of the technical evaluation must be the MAR or a member of the company's technical staff who has been qualified following the company's UL Solutions Technical Evaluation Developer program manual and has passed the UL Solutions Technical Evaluation Developer exam.
- The technical evaluation must reference the applicable ASTM or UL Solutions test standard that it addresses. The technical evaluation may reference clauses of the building code or regulation being enforced for the project, but those references are not mandatory.
- Utilize and reference the Recommended IFC guidelines for evaluating and writing EJ guidelines for developing technical evaluations.

## PROGRAM REQUIREMENTS

### Minimum Required Information for Penetrant Technical Evaluations

1. The evaluation shall be based on and comply with the independent third-party-tested assembly or assemblies, which shall be identified on the document. The evaluation must outline the critical elements per the referenced system required for the stated fire performance rating.
2. **Assembly construction**
  - a. Identify type, thickness, density (if applicable) and fire resistance rating.
  - b. Identify allowable opening size/dimensions.
  - c. Clearly indicate if penetrant only passes through a single membrane of the assembly.
  - d. Identify all surfaces where sealant, putty and spray will be adhered, when applicable.
  - e. When sleeved openings are present, provide details on the sleeve construction, including material type, wall thickness/gauge, projection past assembly surface (if applicable) and fastening method (if applicable).
3. **Penetrant**
  - a. Clearly indicate if the firestop system is a single penetrant or for multiple penetrants.
  - b. Identify penetrating item(s). Include details on penetrant type, size and associated insulation/jacketing (if applicable).
  - c. Clearly indicate if penetrants have any fill limitations, such as cable fill percentages or depth of cable load in trays.
  - d. Clearly indicate if certain penetrant types are not allowed in conjunction with other penetrant classes. (For example, specify that a metallic pipe and a nonmetallic pipe cannot be combined in the same penetrant opening.)
  - e. When nonmetallic pipes are present, indicate whether the piping system is open (drain, waste or vent) or closed (process or supply).
4. **Annular space**
  - a. Annular space measurements shall be described as outlined in the XHEZ guide info in Product iQ.
  - b. Identify allowable annular space (minimum, maximum, nominal, etc.) between penetrant(s) and the periphery of the opening.
  - c. Identify allowable annular space (minimum, maximum, nominal, etc.) between penetrants if multiple penetrants are allowed.
  - d. When sleeved openings are present, identify allowable annular space between sleeve and periphery of opening (if applicable).
5. **Packing material (if applicable)**
  - a. Material type (backer rod, mineral wool, ceramic fiber, fiberglass insulation, etc.).
  - b. Identify firestop product(s) featured within the firestop system and include manufacturer's product name.
  - c. Material density prior to installation (if applicable).
  - d. Thickness or depth of packing material in opening or sleeve.
  - e. When packing material is recessed from surface of assembly or the end of a sleeve, specify that dimension.
6. **Firestop products**
  - a. Identify firestop products, including sealants, putties, sprays and/or preformed devices (collar, wrap strip, cable sleeve devices, pillows/bricks, composite sheet), featured within the firestop system and include manufacturers' product names.
  - b. Report the wet installation depth of sealants, putties and sprays and their positioning within the firestop system. An optional dry thickness measurement may be reported for sprays.
  - c. When crown beads are incorporated into the firestop system, report these material requirements.
  - d. Report the positioning of preformed devices within the firestop system and any other relevant details (layers of wrap strip, wrap strip restraining metal, pillow/brick compression ratio, device orientation, cable fill ratio within cable sleeve device, composite sheet overlap, etc.).
  - e. Identify any attachment hardware or restraining materials that may be required.
7. **Miscellaneous**
  - a. Report the expected hourly rating of the evaluation.
  - b. When optional ratings (e.g., T rating, L rating or W rating) are reported, their values shall be presented using the appropriate units.



**Minimum Required Information for Joint System Technical Evaluations**

1. The evaluation shall be based on and comply with the independent third-party-tested assembly or assemblies, which shall be identified on the document. The evaluation must outline the critical elements per the referenced system required for the stated fire performance rating.
2. **Adjoining construction**
  - a. Identify type, thickness and fire resistance rating.
  - b. Identify all surfaces where sealant and coating will be adhered, when applicable.
3. **Joint orientation** – Specify head-of wall, wall-to-wall, floor-to-wall, floor-to-floor, etc. When the floor consists of fluted deck, indicate the orientation of the joint to the flutes.
4. **Joint width** – Identify joint width as the designed nominal width when possible. When not possible, identify it as the installed width.
5. **Joint movement** – Preferably, identify joint movement by percentage of movement against nominal width for compression and/or extension. As an option, identify joint movement by the total range of movement (for example, 2.5 inches to 3.5 inches on a 3-inch nominal joint).
6. **Movement class**
  - a. Class I – Thermal
  - b. Class II – Wind sway
  - c. Class III – Seismic
7. **Assembly ratings**
  - a. Fire resistance rating
  - b. L rating (smoke, when applicable)
  - c. W rating (water, when applicable)
8. **Forming material**
  - a. Material type – backer rod, mineral wool, ceramic fiber, etc. (Where specified in the base third-party system, the acceptable manufacturer shall be referenced.)
  - b. Material density prior to packing, if applicable
  - c. Thickness or depth of forming material in joint
  - d. Fiber orientation
  - e. Compression percentage
9. **Accessories**
  - a. Allowable penetrating items, to include size, type and annular space requirements.
  - b. Any attachment hardware or restraining materials that may be required.
  - c. Identify any fireproofing that may be incorporated into the design. Material to be installed or applied per the manufacturer’s recommended installation instructions.
  - d. Identify any insulations that may be incorporated into the construction that are incorporated into the firestop design.
10. Splicing details shall be identified for any seams that exist in the joint system.
11. **Sealant, coating or device**
  - a. Identified by product name and manufacturer
  - b. Wet installation depth
  - c. Overlap distance onto adjacent construction, when required
  - d. Any surface primers that may be required
  - e. Products must bear the appropriate certification or marking as indicated in the base design or European Assessment Document (EAD).

## Minimum required information for Perimeter Fire Containment System Technical Evaluations

1. The evaluation shall be based on and comply with the independent third-party-tested assembly or assemblies, which shall be identified on the document. The evaluation must outline the critical elements per the referenced system required for the stated fire performance rating.
2. **Floor construction**
  - a. Identify type, thickness and fire resistance rating.
  - b. Identify all surfaces where sealant and coating will be adhered, when applicable.
3. **Wall assembly construction**
  - a. Mechanical fasteners shall be of the type and spacing identified in the base system.
  - b. Curtain wall insulation – Insulation type, thickness, density, and requirement for facers and/or vapor barriers shall be identified in accordance with the base design – as well as any attachment hardware required per the base design. Identify firestop product(s) featured within the firestop system, and include the manufacturer's product name. The mineral wool must be produced by the same manufacturer identified in the base design.
  - c. Spandrel or backer reinforcement hardware – Placement in the spandrel field and attachment detail shall be in accordance with the base design.
  - d. Spandrel height and width
  - e. Mullion type and spacing and specified protective materials applied to mullions or transoms – Specify the thickness, material and density on protective materials.
  - f. Glazing materials, specifically glass type, glazing pocket sealing materials, etc.
  - g. Spandrel materials, such as exterior facades, backpans, anchor systems, expansion joint materials, etc. shall be specifically defined by material, gauge, thickness, Any framework and protection elements for framing or connections.
4. **Joint width** – Identify joint width as the designed nominal width when possible. When not possible, identify it as the installed width.
5. **Joint movement** – Preferably, identify joint movement by percentage of movement against nominal width for compression, extension or vertical shear. As an option, identify joint movement by the total range of movement (for example, 2.5 inches to 3.5 inches on a 3-inch nominal joint).
6. Movement class as follows, and as applicable for dynamic joint systems:
  - a. Class I – Thermal
  - b. Class II – Wind sway
  - c. Class III – Seismic
7. **Assembly ratings**
  - a. Fire resistance rating
  - b. T rating (where applicable)
  - c. Integrity rating (where applicable)
  - d. Insulation rating (where applicable)
8. **Forming material**
  - a. The material type shall be in accordance with the base design. Where specified in the base third-party system, the acceptable manufacturer shall be referenced. Identify firestop product(s) featured within the firestop system, and include the manufacturer's product name. The mineral wool manufacturer must be certified by the third-party testing lab referenced in the base design.
  - b. Material density prior to packing, if applicable.
  - c. Thickness or depth of forming material in joint
  - d. Fiber orientation
  - e. Percentage compression
9. **Accessories**
  - a. Allowable penetrating items, to include size, type, and annular space requirements.
  - b. Any attachment hardware or restraining materials that may be required.
  - c. Identify any fireproofing that may be incorporated into the design. Material to be installed or applied per the manufacturer's recommended installation instructions.
  - d. Identify any insulations that may be incorporated into the construction that are incorporated into the firestop design.
  - e. Anchor protection shall be identified and specified.
  - f. Products must bear the appropriate certification or marking as indicated in the base design or EAD.
10. Splicing details shall be identified for any seams that exist in the joint system.
11. **Sealant, coating or device**
  - a. Identified by product name and manufacturer
  - b. Products must bear the appropriate certification or marking as indicated in the base design or EAD.
  - c. Wet installation depth
  - d. Overlap distance onto adjacent construction when required
  - e. Any surface primers that may be required

## PROGRAM REQUIREMENTS

### Additional Requirements for Duct-wrap Technical Evaluations

1. The evaluation shall be based on and comply with the independent third-party-tested assembly or assemblies, which shall be identified on the document. The evaluation must outline the critical elements per the referenced system required for the stated fire performance rating.
2. Provide complete descriptions of critical elements for the fire-resistant duct-enclosure system configuration. These should include, but are not limited to the following:
  - a. Duct system type – e.g., kitchen exhaust, hazardous material exhaust, air distribution, etc.
  - b. Duct construction – Dimensions, material, gauge, reinforcement, connections, orientation (horizontal, vertical or both)
  - c. Enclosure system – Brand name designation, description and fire resistance rating to be achieved:
    - Thickness, density, number of layers, fire resistance rating, clearance to combustibles
    - Applicable installation details, such as mechanical attachments, material joints/overlaps, duct support system and access door construction
    - Firestop system – See minimum requirements for penetrant technical evaluations.
  - d. Products must bear the appropriate certification or marking as indicated in the base design or EAD.

## Appendix D – Competency Requirements for MAR and Evaluation-Writing Staff

The MAR and all technical personnel involved in developing firestop technical evaluations must demonstrate an acceptable level of competency prior to engaging in evaluation preparation or oversight of this activity (see below for minimum criteria). Competency shall consist of theoretical knowledge derived from educational exposure and/or direct experience with fire testing, recognizing that the additional responsibilities placed on an MAR call for more rigorous requirements than those for technical personnel. The necessary credentials for each type of position are described in the following sections.

Individuals acting as MARs for a firestop manufacturer shall at a minimum meet the following levels of educational and experience-based competency:

1. Graduation from a four-year ABET- or CEAB-accredited engineering program and completion of two years of full-time employment at that specific firestop manufacturer with responsibilities including the development of evaluations as a primary work function

**OR**

Completion of five years of full-time employment at that specific firestop manufacturer with responsibilities including the development of evaluations as a primary work function, to be determined by the MAR based upon the individual's job title and responsibilities

2. Knowledge of the expected performance of all the materials of that specific firestop manufacturer, including behavior when those materials are subjected to fire exposure, which shall be verified internally, and training record documented by management
3. Knowledge of the expected performance of all elements of construction relevant to conditions for which the firestop manufacturer will potentially issue an evaluation, including behavior when those elements of construction are subjected to fire exposure
4. Familiarity and understanding of all test standards relevant to conditions for which the firestop manufacturer will potentially issue an evaluation as proven by passing of the UL Solutions Technical Evaluation Developer exam

5. Witness in person at least one fire test conducted per each type of product, joint system, penetrant, curtain wall or wrap application relevant to conditions for which the firestop manufacturer will potentially issue an evaluation

Technical personnel preparing firestop technical evaluations for a firestop manufacturer shall at a minimum meet the following levels of educational and experience-based competency. The MAR is expected to maintain a list of qualified staff and update records for all personnel involved with the program.

1. Graduate from a four-year ABET- or CEAB-accredited engineering program and complete a three-month probationary period during which all evaluations are reviewed by the MAR prior to being issued

**OR**

Graduate from a four- or two-year ABET- or CTAB-accredited engineering technology program and complete a six-month probationary period during which all evaluations are reviewed by the MAR prior to being issued

**OR**

Complete one year of full-time employment that will be considered probationary and during which all technical evaluations shall be reviewed and signed by the MAR before being issued

2. Knowledge of the expected performance of all the materials of that specific firestop manufacturer, including behavior when those materials are subjected to fire exposure
3. Knowledge of the expected performance of all elements of construction relevant to conditions for which the firestop manufacturer will potentially issue an evaluation, including behavior when those elements of construction are subjected to fire exposure
  - a. Keep logs of training, experience and testing, which the MAR will review and approve annually

## PROGRAM REQUIREMENTS

4. Complete familiarity and understanding of all test standards relevant to conditions for which the firestop manufacturer will potentially issue an evaluation as proven by passing the UL Solutions Technical Evaluation Developer exam
5. Witness in person at least one fire test conducted per type of product, joint system, penetrant, curtain wall or wrap application relevant to conditions for which the firestop manufacturer will potentially issue an evaluation or review video footage of at least one fire test and the accompanying complete test report conducted per each individual test standard relevant to conditions for which the firestop manufacturer will potentially issue an evaluation.
6. Hands-on experience with products and use of materials such as installation and maintenance of those products in the testing laboratory as a fire stop installer or contractor or while serving in a technical service and support role

### Record Keeping for Technical Competencies

1. According to the quality audit report, maintain a list of staff involved with the development of technical evaluations. As necessary, sort the list by location or by type of product expertise.
2. The staff list should include full names, titles and records of training dates.
3. Maintain training records for each staff member that include comments on tests witnessed, test standard reviews and training on materials manufactured by the company.
4. Record methods of assessment and approvals of competency by company officers for the MAR and other staff.
5. Log training records regarding staff instruction, dates of exams and continuing education activities, including CEU credits earned.

## Appendix E – Peer Review of Technical Evaluations

1. Technical evaluations can only be written and issued by the MAR or the company's technical personnel who have met the requirements outlined in the company's technical evaluation quality manual.
2. To ensure that the quality of technical evaluations meets the requirements of the UL Solutions Technical Evaluation quality manual, the technical evaluation must be reviewed and approved internally by the another technical team member who has passed the UL Solutions Technical Evaluation exam and is employed by the same company.
3. The reviewer must be the MAR or a company technical representative who has met the requirements outlined in the UL Solutions Technical Evaluation Certification protocol.
4. The reviewer's name and signature may be included on the technical evaluation. If the reviewer's name and signature are not included on the technical evaluation, it must be included with the supporting documentation kept in the project file and retained for purposes of the UL Solutions auditing process.
5. The internal review procedures must be followed before the technical evaluation can be issued.

## Appendix F – Continuing Education Requirements

To maintain eligibility within the program, after demonstrating a proper degree of educational competency and/or the necessary fire testing experience, technical personnel or the MAR shall continue developing skills to aid in meeting their responsibilities. Continuing education allows technical personnel and the MAR to maintain their proficiency. After admission into the program, technical personnel and the MAR must earn 3 CEUs over every three-year period. Each CEU is equivalent to 10 contact hours of participation in recognized and relevant educational activity.

### Weighting of CEUs

- 1 CEU for IFC, PFPF, ASFP, FCIA or other industry-related participation over three years
- 1 CEU for witnessing fire testing
- 1 CEU for attending industry-specific seminars, courses or classes regarding firestopping, perimeter containment or duct-wrap applications, or for attending courses on codes and standards pertaining to fire containment and fire-resistive construction

CEUs will be granted for the activities outlined below. One CEU will be assigned for every 10 hours of contact participation in organized industry-related events or testing time in the laboratory:

- Participation in an industry-related conference
- Participation in an industry-related professional organization (1 CEU maximum)
- Successful completion of an industry-related educational course at an ABET- or CEAB-accredited college or university
- Presentation of relevant instructional training at industry-related events (Up to 2 CEUs can be granted for presentations, but the CEUs will only be granted for the first time the material is presented.)
- Publication of an industry-relevant article in a trade magazine or website (1 CEU granted per article)
- In-person witness of a fire test conducted per an individual test standard relevant to conditions for which the firestop manufacturer will potentially issue an evaluation
- ASTM/UL Standards and Engagement standards development participation
- NFPA, ICC, ASHE, SFPE or related industry event, such as ASHRAE or FGIA

### MAR Recertification

An MAR employed by a UL Solutions Technical Evaluation Developer program who meets the CEU requirement or successfully completes reexamination during their certification period is issued a new letter of completion.

This letter is valid for a three-year period and subject to the rules and conditions of the program requirements.

## Appendix G – Referenced Documents and Standards

Firestop technical evaluations vary in scope since they cover a range of applications, including penetration firestops, joint systems, perimeter fire containment systems and fire-rated duct systems. The MAR of each firestop manufacturer issuing evaluations shall establish a list of reference materials to aid their technical personnel in the development of sound evaluations. These reference materials shall be available to technical personnel at all times.

Each firestop manufacturer may provide reference materials as they deem appropriate to facilitate evaluation preparation. However, at minimum the applicable test standard of any firestop system referenced within an evaluation and the test report(s) associated with the development of that referenced system shall be available to the individual preparing an evaluation. Test standards are not static documents, so the most current revision and any relevant historical editions of any applicable test standard shall be available. For training and continuing education purposes, the default determination of competency would be against the latest published version of the standard. Any training on previously issued editions shall be noted in the technical competency record for the evaluator.

The following list of standards, codes and other technical documents are suggested for firestop manufacturers to consider when establishing a reference library.

### European Standards

**EN 1364-1** Fire resistance tests for non-loadbearing elements - Part 1: Walls

**EN 1364-2** Fire resistance tests for non-loadbearing elements. Ceilings.

**EN 1364-3** Fire resistance tests for non-loadbearing elements. Curtain walling. Full configuration – (Complete assembly)

**EN 1364-4** Fire resistance tests for non-loadbearing elements - Part 4: Curtain walling – (Part configuration)

**EN 1364-6** Fire resistance tests for non-loadbearing elements - Part 6: Cavity Barriers

**EN 1365-1** fire resistance tests for loadbearing elements. Part 1: walls.

**EN 1365-2** Fire classification of construction products and building elements.

**EN 1366-1** Ducts

**EN 1366-2** Dampers

**EN 1366-3** Fire resistance tests for penetration seals

**EN 1366-4** Fire resistance tests for linear joint seals

**EN 11925-2** Reaction to Fire Test Standard for Ignitability of Products subjected to Direct Impingement of Flame

**EN 13501-1** Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests.

**EN 13501-2** Fire Classification for Building Products and Elements

**EN 13501-3+A1** Classification for Fire Resisting Ducts

**EN 15882-3** Fire resistance EXAP for service Penetration Seals (cables and pipes)

**EN 15882-5** Fire resistance EXAP for Combined Penetration Seals

**EAD-350141-00-1106** LINEAR GAP SEALS

**EAD-350454-00-1104** PENETRATION SEALS

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### North American Standards

**ASTM E 119**, Standard Test Methods for Fire Tests of Building Construction and Materials

**ASTM E 276**, Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials

**ASTM E 814**, Standard Test Method for Fire Tests of Through-Penetration Fire Stops

**ASTM E 1725** Standard test method for fire resistive barrier systems for electrical system components ASTM E 1966, Standard Test Method for Fire-Resistive Joint Systems

**ASTM E 2307**, Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus

**ASTM E2336** Standard test method for fire resistive Grease Ducts enclosure systems

**ASTM E 2750** Standard guide for extension of data from penetration firestop system tests

**ASTM E 2816** Standard test methods for fire resisting metallic HVAC Ducts systems

**ASTM E 2837** Test method for determining fire resistance of Continuity Head-of-Wall Joint systems installed between rated wall assemblies and non-rated horizontal assemblies

**ASTM E 2874** Standard Test Method for determining the fire test response characteristics for building spandrel panel assembly due to external spread of fire

**ASTM E 3037** Measuring Movement capabilities of Through Fire Stop Systems

**CAN/ULC-S115** Standard method of fire testing Firestop Systems (Service Penetrations)

**CAN/ULC-S115** Standard method of fire testing Joint Systems

**CAN/ULC-S144** Standard method of fire test – Grease duct systems

**UL 263** Standard for Fire Tests of Building Construction and Materials

**UL 723** Standard for Test of Surface Burning Characteristics of Building Materials

**UL 1479** Standard for Safety for Fire Tests of Through-Penetration Fire Stop

**UL 1489** Pipe carrying combustible materials

**UL 1715** Standard for Fire Test of Interior Finish Material

**UL 1724** Outline of investigation for fire tests for electrical circuit penetration firestop system tests

**UL 2079** Standard for Tests for Fire Resistance of Building Joint Systems.

**UL 2196** Fire rated cable systems

**UL 2221** Standard for tests of fire resisting Grease Duct enclosure assemblies

\*Some jurisdictions accept ASTM E2307 for perimeter joints

\*\*Some jurisdictions accept ASTM E2837



## PROGRAM REQUIREMENTS

### Other Standards and DOCUMENTS – International, UAE and Australia

**AS 1530-4** Methods for fire tests on building materials components and structures - Fire-resistance test

**AS 4072-1** Components for the protection of openings in fire-resistant separating elements Service penetrations and control joints

**BS 476 Part 7** Fire Tests on Building materials and structures; method of test to determine the classification of the surface spread of flame of products

**BS 476 Part 6:** Fire Tests on Building materials and structures; method of test for fire propagation for products

**BS 476-20 1987** Fire tests on Building Materials and Structures

**BS 476-21** Fire tests on building materials and structures - part 21: Methods for the determination of the fire resistance of loadbearing elements of construction

**BS 476-22** Fire tests on building materials and structures - part 22: Methods for the determination of the fire resistance of non-loadbearing elements of construction

**BS 8414-1** Fire performance of external cladding systems. Test method for non-loadbearing external cladding systems fixed to, and supported by, a masonry substrate

**DIN 4102-9** Fire behaviour of building materials and elements; seals for cable penetrations; concepts, requirements and testing

**DIN 4102-11** Fire behaviour of building materials and building components; pipe encasements, pipe bushings, service shafts and ducts, and barriers across inspection openings; terminology, requirements and testing.

**FM 4880**, Approval Standard for Class 1 Insulated Wall or Wall and Roof/Ceiling Panels; Plastic Interior Finish Materials; Plastic Exterior Building Panels

**FM 4990**, Approval standard for firestopping

**IEEE 383** Cable Flame Tests

**IEEE 634** Standard for cable penetration fire stop qualification test

**IEC 60331** Tests for electrical cables under fire conditions

**ISO 834-1** Fire containment

**ISO 1182** Reaction to fire tests for products - Non-combustibility test

**ISO 1716** Reaction to fire tests for products - Determination of the gross heat of combustion (calorific value)

**ISO 6944-1** Fire containment Elements of building construction part 1: Ventilation Ducts

**ISO 10294-1 1996+A1** Fire Resistance Tests Air Movement Dampers

**ISO 11925-2** Reaction to fire tests - Ignitability of products subjected to direct impingement of flame - Part 2: Single-flame source test.

**IS 12458:** Fire Resistance of Through Penetration Firestops — Method of Test

**LPS 1208**, LPCB fire resistance requirements for elements of construction used to provide Compartmentation

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### Reference Documents

NFPA 1 Fire code	ASFP/BESA/FIS Best practice guide for Design, Specification and installation of Services penetrations in fire resisting elements
NFPA 13 Standard for the Installation of Sprinkler Systems	
NFPA 70 National electrical code	Best practice guide on fire stops and fire blocks and their impact on sound transmission (NRCC 49677) ICC Firestopping joint systems and dampers
NFPA 101 Life safety code	
NFPA 204 Standard for Smoke and Heating Ventilation	IFC Guidelines for evaluating firestop systems in engineering judgments
NFPA 25, Standard methods of tests of fire resistance of building construction and materials.	International Fire Code
NFPA 28, Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.	International Mechanical Code
NFPA 80A Practice for Protection of Building from Outside Fires	National Building Code of Canada
NFPA 5000 Building Construction and Safety Code	SFPE Handbook of Fire protection engineering
NFPA Fire Protection Handbook	SFPE Engineering guide to performance based fire protection

**This is a nonexhaustive list of developed standards.**

## Appendix H – Template for Technical Evaluations

# Technical Evaluation Report

**Report Number:** TER[?? ]

**Title:**

Technical Evaluation Fire Stopping Solution to assess the performance of [product name(s)] to reinstate the overall fire performance of the supporting construction for [Project Name]

**Prepared for:**

[Client name and address ]

**Date Issued:**

[??????]

**Prepared by:**

Manufacturer company name & Address

Designated Responsible Individual:



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