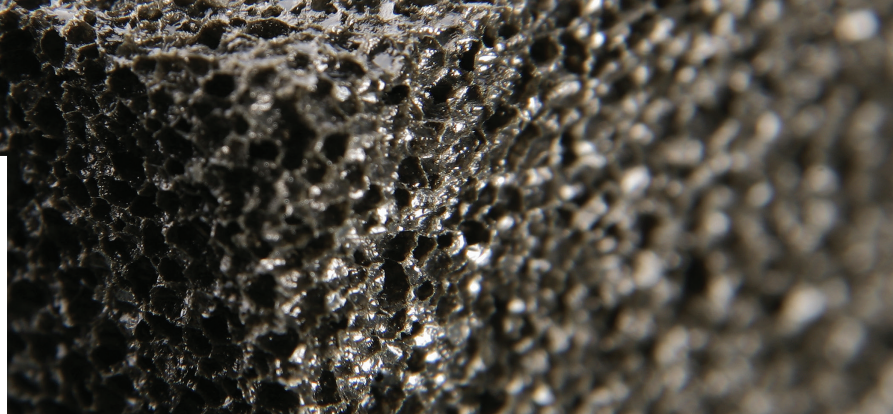




FOAMGLAS®

TECHNICAL NEWSLETTER



PASSIVE FIRE PROTECTION IN BUILDINGS WITH THROUGH PENETRATION FIRE STOP SYSTEMS

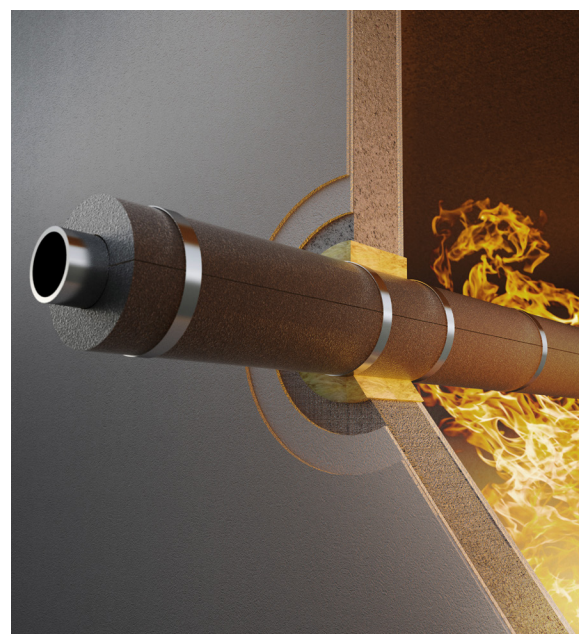
Personnel safety is the most important criteria when designing buildings, especially buildings with high occupancy. When fire safety is considered, large buildings are often divided into separate compartments that will help prevent the quick spread of fire throughout the building. These “fire-compartments” are divided by fire-rated walls with insulated piping systems, usually HVAC supply and return pipes, running through them. Through-penetration fire-stop systems are therefore put in place to keep the resistance of a fire-rated wall which will help to contain a fire in case of emergency.

THOUGH PENETRATION FIRE STOP SYSTEMS

Fire spreads from one compartment to another by the collapse of a barrier or through openings where flames, hot gases or sufficient heat can ignite combustibles that are beyond that barrier. When HVAC or electrical systems are installed, it requires the penetration of fire-resistive assemblies by pipes, ducts and cables. This creates a breach in fire-rated walls or floors, and this is where through penetration fire-stop systems come into play.

Through-penetration firestop systems are installed in fire-resistance-rated assemblies to impede the passage of fire and smoke for a prescribed period. These firestops also help maintain the integrity of the wall, ceiling or floor in which they are installed. A through-penetration firestop system consists of a fire-resistive assembly or fire barrier (wall, floor, etc.), the penetration (ducts, pipes, conduits, etc.); and the insulation system (insulation material in combination with possible accessory products).

Overlooking or incorrectly installing through-penetration fire stop systems can seriously increase the risk of fire and smoke spread which can lead to life-threatening situations for the people that are present in the building and result in increased property damage.



THROUGH PENETRATION FIRE STOP TESTING

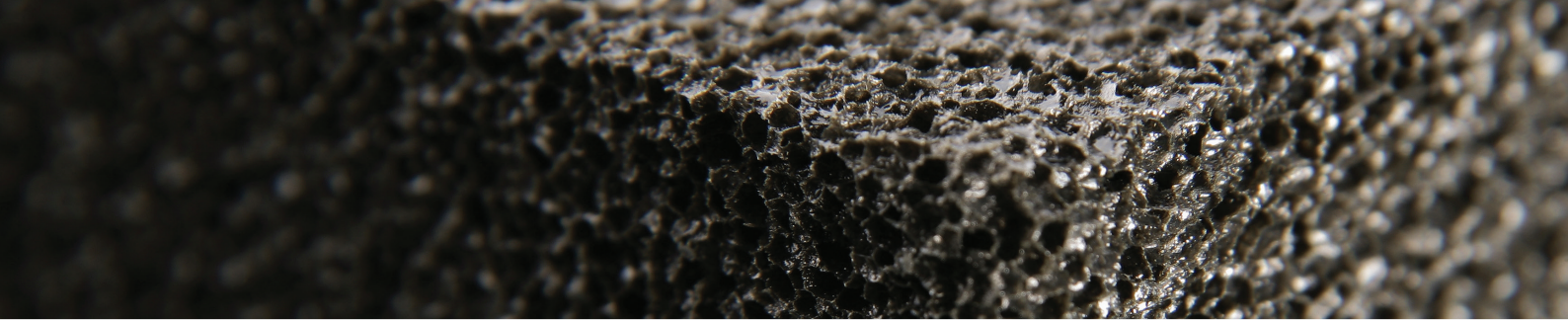
The performance of through penetration fire stops is measured and specified according to common standards that describe the method of fire exposure and rating criteria.

EN 1366-3: Fire resistance tests for service installations - Part 3: Penetration seals

This part of EN 1366 specifies a test method and criteria to evaluate (including field application rules) a penetration seal's ability to maintain the fire resistance of a separating element where it has been penetrated by a service.

The purpose of EN 1366-3 is to assess:

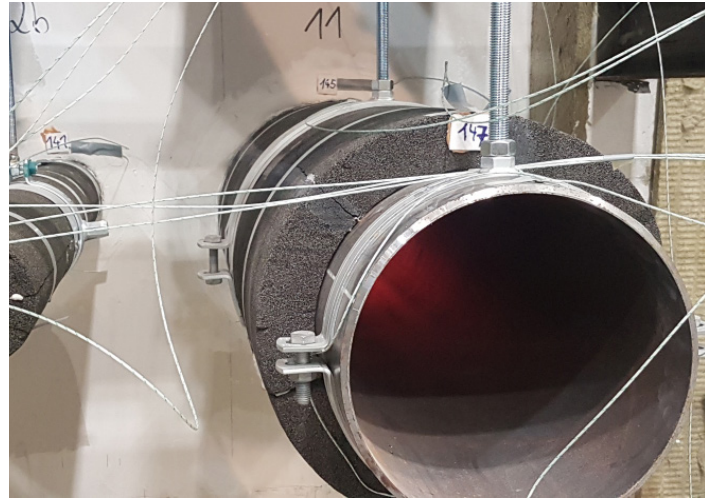
- The effect of such penetrations, including the integrity and insulation performance of the separating element and penetration seal.
- The insulation performance of the penetrating service or services, and where necessary, the integrity failure of a service.



Once systems are tested in accordance with EN 1366-3, they are then classified in accordance with EN 13501-2. In this European classification of the resistance to fire performance, resistance to fire penetration (integrity), is denoted E and resistance to the transfer of excessive heat (insulation), is denoted I. This gives a fire resistance classification from 15 minutes (E15/EI15) to 240 minutes (E240/EI240).

It is important to note that the overall fire performance classification of the compartmentation is limited by the lowest classification of the assembly or penetration seal.

Test results obtained with certain constructions cover constructions of lesser fire resistance provided they conform with material classification in accordance with BS EN 13501-1.



ASTM E814 (or UL standard 1479): Standard Test Method for Fire Tests of Penetration Firestop Systems

ASTM E814 (or UL Standard 1479) is a test method used to determine the performance of a fire stop with respect to exposure to a standard temperature-time fire test and hose stream test.

The rated performance of a fire stop is dependent upon the specific assembly of materials tested including the number, type, and size of penetrations and the floors or walls in which it is installed.

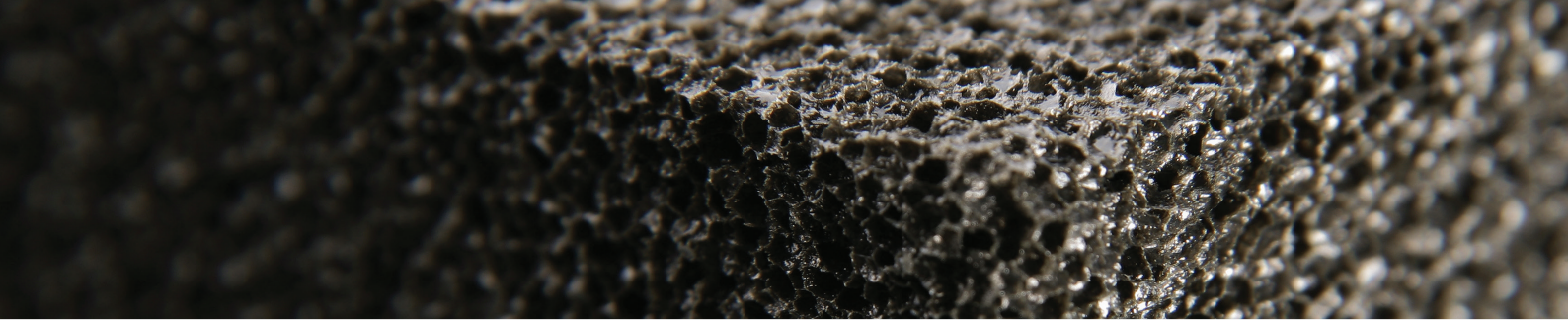
ASTM E814 is complementary to ASTM E119, which is defined by fire tests of building construction and materials to assess fire-resistive floor or wall assemblies and how they perform as a barrier to the passage of flame, heat, hot gases and smoke in a fire situation.



The following ratings are established for each fire stop:

- F rating – Fire rating, in hours. The specific length of time a fire-resistive barrier can withstand fire before being consumed or permitting the passage of flame through an opening in the assembly.
- T rating – Time for the non-fire side of a fire-rated assembly to reach 162 °C (325 °F) above its ambient temperature.
- L rating – Measure the fire-resistive assembly's ability to resist air or smoke infiltration resulting from pressure differences. Usually measured in cubic feet per minute per square foot of opening. The complete fire-stop system typically includes the firewall, penetrating item or gap, insulation at a specified thickness, or other material combinations required.





DETERMINING THE CORRECT THROUGH PENETRATION FIRE STOP SYSTEM

Choosing an applicable through penetration fire stop system starts with the determination of the required hourly ratings for the system. Once this has been determined, the search for a specific system begins. As earlier mentioned, the three main elements that will help determine the applicable system are the type of fire barrier, the penetrating item and the insulation system. When designing a fire stop system it is important to select firestopping assemblies that are third-party tested and certified by an accredited organization. Firestopping products should be certified or CE marked and tested using the relevant standards.

Lastly, installation in accordance with ASTM, UL and EN system requirements is equally important. Follow the instructions specific to the system being installed and pay attention to every detail to ensure the integrity of the fire rating.

FOAMGLAS® INSULATION FIRE WALL PENETRATION SYSTEMS

FOAMGLAS® insulation is noncombustible and highly suitable for use in through penetration fire stop systems, not adding any fuel to the fire or producing any smoke and toxic fumes. FOAMGLAS® cellular glass insulation has been widely tested by third parties and is proven acceptable for use in multiple penetration fire stop systems. This includes various wall and floor materials, combined with several fire stop sealants. Approved systems incorporating FOAMGLAS® insulation are available for different material pipes (plastic, copper, steel, etc.), for thicknesses up to 120 mm (4.7") and pipe diameters up to 500 mm (20").

FOAMGLAS® insulation fire stop system's benefits:

1. FOAMGLAS® insulation has been successfully tested for a maximum 4 hour F rating.
2. FOAMGLAS® insulation was tested with the point of contact on one side. This represents a worst-case situation and means that a pipe insulated with FOAMGLAS® insulation does not have to be centered in the penetration opening.
3. The FOAMGLAS® insulation system is simple and relatively inexpensive compared to other fire-stop systems.



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