

# Manufacturer's Critical Role in Engineering Judgments: Manufacturer Involvement in Firestop Engineering Judgments Should Never Be Considered Optional

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Use of an Engineering Judgment is an option that is often used when there is not a single matching firestop system that is tested and listed for a precise set of field conditions. This applies to firestopping for through penetrations, membrane penetrations, joints, and perimeter fire containment (edge-of-slab joints).

## An EJ is a deviation from known tested systems

Developing a sound engineering judgment that is likely to provide the required fire resistance rating requires answering one key question: “What changes to the details of one or more previously tested systems are acceptable before a proposed firestop fails to perform?”

A failure could be defined as any reduction of the fire resistance rating below the hourly rating required by code for the specific application. A failure could also be a dramatic reduction in fire performance, wherein the proposed deviation from tested systems fails very early on, due to some critical flaw. Firestopping installations can have “tipping points” after which the fire containment could fail very suddenly.

## Who would know whether a deviation would result in acceptable firestop performance?

The International Firestop Council's (IFC) [“Recommended IFC Guidelines for Evaluating Firestop System Engineering Judgments”](#) have always stated the following in Rule #2:

EJs for firestop systems should be issued only by a firestop manufacturer's qualified technical personnel or in concert with the manufacturer by a knowledgeable registered Professional Engineer, Fire Protection Engineer, or an independent testing agency that provides listing services for firestop systems.

Why would the IFC EJ guidelines preclude anyone from issuing EJs without the involvement of the manufacturer?

Ask yourself one question: “who possesses this information about the tipping points between a pass and a failure?”

Is it the design professional, who might have read and reviewed dozens of tested and listed systems? Consider that listed systems tell you only what specific installation conditions have *passed* the fire test and provide the needed hourly rating. A design professional will never get to see the unpublished fire testing that revealed when, how, and why a given installation might fail, and thus where the pass/fail points exist.

So, who does know how and when a proposed firestop installation might fail to provide a desired hourly rating? It's a very easy and correct guess to say, “the firestop manufacturer”.

## Testing leads to failure, and failure leads to understanding

One might think that firestop manufacturers can intuitively (magically?) predict with great certainty how, and within how much time, a given firestop installation involving their products will fail. The truth of the matter is that firestop manufacturers spend months and even years in repeated fire tests trying product formulations under different conditions. They explore where the cliff edges between successful and unsuccessful fire performance exist. For example, a given intumescent firestop sealant formulation might be repeatedly tested on different pipe diameters of different non-metallic pipes to see which can be closed off successfully and which will not be closed off successfully. For each combustible pipe type, each firestop product is pushed to its limits, with the hopes of firestopping ever larger pipe diameters, ever larger maximum annular spaces, and ever smaller minimum annular spaces. The manufacturer will keep testing until they get failures and thus learn of the limits between pass and fail. No manufacturer would ever leave “money on the table” by not testing ever more challenging conditions for a given product. A manufacturer yearns to advertise that their firestop product XYZ is good for conditions that equal or better their competitors’ products.

The large number of fire tests needed to find out all the different field conditions that could lead to failure might not all be conducted prior to bringing a new product to market. New products are inevitably brought to market as quickly as possible, under pressure from marketing departments and financial considerations. That would often be done with just a small handful of tested and listed systems. The manufacturers’ technical staff will continue fire testing the products under ever more challenging conditions in the coming months and years, hoping to provide some impressive new applications and system listings. Just like at the development stage, lots of those fire tests will fail.

It’s that large volume of failed fire tests that allow a manufacturer to issue engineering judgments that have a high likelihood of delivering on the hourly fire resistance rating that the engineering judgment states.

## Manufacturer involvement in EJs is essential

Using a firestop engineering judgment that has not been developed by, nor reviewed by, the firestop manufacturer should raise concerns about liability, reliability, accuracy, and compliance. Without the manufacturer’s warranty backing the EJ, contractors are left vulnerable to potential risks. Bypassing manufacturer consultation can have significant consequences, including voiding the manufacturer’s warranty. Without this warranty, contractors may face additional exposure to liability should the firestop system fail.

Design professionals are not prohibited from rendering opinions. Ultimately, it is up to the Authority Having Jurisdiction (AHJ) to determine whether to accept or reject an EJ. However, the IFC EJ Guidelines emphasize that engineering judgments should be developed by, or in collaboration with, the manufacturer of the materials in question.

It bears mentioning that all manufacturer-members of the International Firestop Council provide EJ request services at no cost to the customer when it involves the use of their products. Be prepared to have some EJ requests denied though! Knowing what will work and what will fail to perform means that manufacturers will inevitably identify some EJ requests as “not possible”.

In summary, while design professionals are entitled to provide opinions, collaboration with manufacturers ensures the integrity of engineering judgments, protects warranties, and upholds safety standards. By fostering this collaboration, the industry can continue to deliver effective fire protection solutions while minimizing liability risks for all stakeholders.