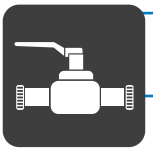
By Andrew Quattrociocchi

Firestopping combustible pipes

The firestopping of combustible pipes has always been a soft spot for plumbers and inspectors. The National Building Code of Canada and the code in my part of Canada (Ontario) are very similar in requirements, but do share a few differences.

Since plastic piping systems are used so widely in construction today, I've teamed up with Kevin Yong-Ping, one of IPEX's engineers, to raise the awareness of firestopping best practices as they relate to combustible pipe penetrations.

So, let's take a look.



Getting with the code

Both the 2015 National Building Code and 2012 Ontario Building Code explain that, aside from a few exceptions, any time a fire separation or a membrane that's part of a fire separation assembly is penetrated by such things as pipes, vents or conduit, a firestop needs to be used or the penetration needs to be cast in place.

Note that there is an F rating requirement with firestops. These are based on tests outlined in CAN/ULC-S115, and details of the requirements can be found in Table 3.1.8.4. in your code book.

Where these penetrations are horizontal, there is an FT rating requirement, also based on CAN/ULC-S115, and this generally requires the firestop to have a resistance rating equal or greater than the rating of the firewall or fire separation.

An exception to these requirements is extended to sprinkler systems, provided that the annular space created by the penetration is covered by a metal escutcheon plate. Some fire dampers are also permitted to penetrate a fire separation, provided that they are installed in compliance with NFPA 80.

When it comes to combustible pipe penetrations, you'll find these in section 3.1.9.5 of the National Building Code, and 3.1.9.4 in the Ontario Building Code.

When talking about this with your local inspector, don't get the reference mixed up. In Ontario, 3.1.9.5 is "openings through a membrane ceiling."

System 15 piping with a cast-in place firestop device providing a 2HR FT rating in a 3.2.1.2 parking garage slab.

The Ontario code outlines the specific cases where combustible piping can penetrate a fire separation required to have a fire-resistance rating, or a membrane that forms part of an assembly required to have a fire-resistance rating.

Again, with a few exceptions outlined in the code book, combustible piping is permitted to penetrate a fire separation required to have a fire-resistance rating or is permitted to penetrate a membrane that forms part of an assembly required to have a fire-resistance rating, provided the piping is sealed at the penetration by a firestop that has an F rating not less than the fire-resistance rating required for the fire separation, as per the fire test method in CAN/ULC-S115. A pressure differential of 50 Pa is required between the exposed and unexposed sides, with the higher pressure on the exposed side.

Combustible drain piping is permitted to penetrate a horizontal fire separation, provided it leads directly from a non-combustible water closet through a concrete floor slab and the piping is sealed at the penetration by a firestop.

Combustible piping can also penetrate a vertical or horizontal fire separation if both sides of the separation are sprinklered, and an appropriate firestop seals the penetration.

For public pools and spas, there's also an allowance for combustible piping containing chlorine gas, provided that the piping is not more than 25 mm in diameter, and that an appropriate firestop is used.

With all of these uses, check your local code for the appropriate FT rating to ensure that the firestop used conforms to requirements. And, where necessary, watch to ensure that the firestop test is tested with a pressure differential of 50 Pa between the exposed and unexposed sides, with the higher pressure on the exposed side. Also review whether the fire compartments on each side of the firewall or horizontal fire separation need to be sprinklered.

QUATTRO'S CORNER

con't from page 54

Upholding the integrity

In essence, if you're penetrating a fire separation with either non-combustible or combustible piping, you'll need to uphold the integrity of that fire separation, and thus provide a valid firestop listing that matches your site conditions. For plastic piping, you'll find that there are a variety firestop product options available.

Through-penetration firestop products work by filling the voids around penetrating items in fire rated walls and floors. When combustible products are used, these firestop products "intumesce" or expand in the presence of heat, thereby sealing and stopping the spread of flames and smoke outside of the fire compartment.

Most applications will require an F-Rating, which is typically the fire resistance rating of the assembly. However, under 3.1.9.1(2), when penetrating a firewall or under 3.2.1.2, a slab, an FT-Rating is required, which will limit the transmission of high temperatures through the assembly as well as the fire resistance rating.

The firestop checklist

When working with firestop listings for combustible piping, here are a few things to look for:

1. Check to see if the listing has been tested with a 50 Pa pressure differential. This is required in all provinces, with Ontario having a few exceptions to this rule.
2. Make sure the required annular space is being followed per the listing.
3. Check to make sure the penetrant being used is called out in the listing. It is important to note that if a specific piping is being used on a jobsite, then that piping should be identified on the listing. Sometimes a listing simply indicates PVC, but it is always best to check with the firestop manufacturer when clarification is needed.
4. Gather your listings upfront and be sure to review them with the building official prior to installation.
5. When in doubt, call the pipe or firestop manufacturer for help.

If in doubt, ask!

There is a benefit to working with the pipe or firestop manufacturer when choosing the right listing. The firestop listing will tell you exactly what's required, and this must be followed to a tee.

Different firestop manufacturers may have different solutions for the same application, so don't make the assumption that what you use for metal piping will be the same for plastic

Expanding the stopping options

It was once thought that one must use a firestop collar as the only means of firestopping plastic piping. This is old-school thinking.

Today, there are many firestop products on the market that have been designed for use with plastic piping systems. For example, contractors can choose from intumescent caulking, wrap strips, collars, or cast-in place devices, to name a few when working with plastic piping.

Andrew Quattrociocchi, C.B.C.O., is the deputy chief building official for the Township of Oro-Medonte, and a director with the Ontario Plumbing Inspectors Association. If you have any questions or a funny photo you would like to possibly see in an upcoming edition of Quattro's Corner, feel free to send an email to Andrew at quattroscorner@hotmail.com.