Since the International Building Code (IBC) and the International Residential Code (IRC) have been redrafted in recent years, the building industry has had the opportunity to clarify code requirements that relate to fireblock penetration sealing. Specifically, the industry has developed a more detailed approach to the types of materials that are permitted for sealing the annular space created whenever fireblocking is breached.

**What Is a Fireblock?**

There are important distinctions between fireblocking and firestopping. Today’s codes are changing to reflect the clear differences between the practices.

Fireblocking is currently defined as any material that is installed within concealed spaces to resist or block the migration of fire and hot gases for an undetermined period of time. Fireblocking is used to subdivide or block off the stud cavity inside a wall, in a soffit over cabinets, between stair stringers at the top and bottom of a run, in an exterior cornice, or in the space between the combustible finish materials and the wall itself.

For Type V residential construction, “fireblocking” is defined even more narrowly (according to ICC-ES Legacy Report NER-645). That report classifies the wood frame member that forms the top or bottom plate of a wood or metal stud framed cavity wall as a fireblock. It is simply either a single or double thickness dimensional lumber used during the wall construction.

**Looking at the Codes**

One former regional model code historically required noncombustible materials to be used to protect penetrations (such as piping, ducts, flues or vents that are located within the wood frame wall) as they pass through and penetrate the members serving as fireblockings.

The 1996 National Building Code, the 1997 Uniform Building Code, and the 1997 Standard Building Code all addressed the issue of combustible construction. The language was somewhat varied from

(continued on page 2)
Effective Fireblocking (continued from page 1)

Each regional model code, but one code indicated: “Fireblock penetration sealings shall consist of approved noncombustible materials securely fastened in place at openings around vents, pipes, ducts, chimneys and fireplaces at ceiling and floor levels.”

Most recently, the 2000 IBC and IRC (in Section R602.8) eliminated the “noncombustible” requirements for fireblocks that were historically contained in the SBCCI Model Code. These revised codes state that fireblock penetration seals are approved to resist flame and combustion. Thus, the use of combustible materials as fireblock or fireblock seal is permitted where appropriate. These new code sections are more consistent with the original intent of the fireblocking guidelines. Dow has performed diversified testing as outlined in NER-645 demonstrating that combustible foam fireblock penetration seals are effective. This product is supplied in an easy to identify orange color and is labeled with the NER-645 marking as well for easy field inspection.

Using the Most Effective Materials for Fireblock Penetration Sealing

The most common materials used for fireblock penetration annular space protection have included:

- One thickness of ¥4-inch particle board with joints backed by the same
- ½-inch gypsum board
- ¥4-inch cement-based millboard

Most of these materials have two things in common: they are very hard to install, and they cannot block air effectively, which is a key requirement to effectively contain fire and smoke.

Fortunately, alternate materials are available to today’s homebuilders. GREAT STUFF™ Pro polyurethane foam sealant from Dow has been tested and approved (as described below) for use in fireblocking applications. GREAT STUFF™ polyurethane foam sealant completely fills fireblock penetration holes by expanding just enough to fill the entire void area. A non-expanding sealant product does not have this feature.

In Legacy Report NER-645, the ICC-ES considered testing results from Omega Point Laboratories for GREAT STUFF™ Pro polyurethane foam sealant and reported, “The foam has been tested in accordance with ASTM E814 to establish that the product is equivalent in performance to the fireblocking materials prescribed in the applicable code.”

Does this ruling apply to every jurisdiction? The evidence suggests it does.

Simply put, any jurisdiction or local code based on or recognizing the International Code Council as their model code can accept GREAT STUFF™ Pro polyurethane foam sealant products for this application. The local inspector or code official can ask for verification that the product installed is the same as that covered in the NER-645 report.

The NER-645 report allows for the use of GREAT STUFF™ Pro polyurethane foam sealant as a fireblock penetration sealant. GREAT STUFF™ Pro polyurethane foam sealant was the first foam sealant tested for use in hidden cavity penetration sealing in combustible-type construction and has been demonstrated to stay in place during ASTM E814 fire test conditions.
New Innovations spur use of foam insulation below-grade

Insulating the foundation of a home is a sensible investment in today’s energy-conscious environment. An estimated 20-25 percent of a home’s energy loss occurs through the foundation of the residence.

In recent decades, many homeowners turned to foam insulation for their below-grade applications. But in many areas of the country, an unforeseen problem complicated the issue – termites. Although foam insulation contains no food value, inspections showed that termites can tunnel into the foam as they look for food sources. In addition, it was found that the foam itself could provide termites with a protective route into the home.

Code changes soon reflected this concern. In 1999, the Southern Building Code Congress banned the use of foam insulation below-grade in areas with high levels of termite activity (primarily parts of California, Texas, and several southeastern states). This guideline was later adopted by ICC, IRC and IBC.

In the 2006 IRC Building Code, Section R314 and R320.4 addressed the use of foam insulation in areas of very heavy termite infestation. However, the code provided an important exception: if the material includes “an approved method of protecting the foam plastic,” it is considered acceptable for use.

Termite-Resistant Foam

Dow is leading the way in providing new, innovative products for the construction industry with the introduction of STYROFOAM™ BLUEGUARD™ termite-resistant foam insulation.

STYROFOAM™ BLUEGUARD™ termite-resistant foam insulation is an extruded polystyrene foam insulation which contains the Preventol† HS100 (Deltamethrin) insecticide that protects the foam from termites and other wood destroying insects. The insecticide is added to the foam formulation during the manufacturing process, helping to ensure it will remain intact for the life of the foam.

STYROFOAM™ BLUEGUARD™ termite-resistant foam insulation offers the same performance properties as other STYROFOAM™ extruded polystyrene insulation products, such as high R-value (5.0 per inch), high compressive strength, and superior moisture resistance.

In areas of the country where the probability of termite infestation is “very heavy,” building codes do not allow foam plastic insulations to be used on exterior foundation wall or slab foundations located below-grade unless the foam is protected by an approved method, and conventional termite control treatments are used.

Field testing with termites contributes to the successful evaluation of STYROFOAM™ BLUEGUARD™ termite-resistant foam insulation for this application.
Polyurethane foam: exposed or covered?

With the increased use of polyurethane spray foam in a number of residential applications, several discrepancies in code interpretations have also arisen.

One issue in particular troubles some homebuilders: can kit-type polyurethane spray foam be left exposed? And what guidelines apply to these situations?

Portable Kit Spray Polyurethane is More Effective and Safer

To properly understand the correct applications, we need to first look at how polyurethane kit spray foam is used.

FROTH-PAK™ FS25 spray polyurethane foam insulation can be applied to a home under construction. It not only insulates but also reduces air leakage in the building envelope.

FROTH-PAK™ FS25 spray polyurethane foam insulation from Dow is an example of this type of portable kit spray foam. FROTH-PAK™ FS25 spray polyurethane foam insulation is a portable, two-component, polyurethane foam system for insulation and void filling. The material consists of “A” and “B” components, with foam being made by mixing the two through a patented gun and static mixing device.

As the two components of FROTH-PAK™ FS25 spray polyurethane foam insulation mix, “A” and “B” react with each other liberating heat and forming a foam with a density of approximately 1.75 lbs/cu.ft. The material can be sprayed, used as a large bead caulk or poured depending on the application.

Thermal Barriers and Foam

Some objections to leaving polyurethane spray foam exposed revolve around the product’s reaction to flame. In this case, there are some mistaken assumptions about the fire performance of this product.

Like many other polyurethane foams, FROTH-PAK™ FS25 spray polyurethane foam insulation exhibits impressive fire rating properties. When tested in accordance with ASTM E84 at full coverage and at a nominal thickness of 2-inches and a density of 1.75 pcf, the flamespread rating was twenty-five (25), and the smoke developed rating was three hundred and fifty (350).

Thermal Barrier is Not Necessary in Special Circumstances

Not everyone agrees on whether FROTH-PAK™ FS25 spray polyurethane foam insulation requires a thermal barrier when applied to walls. The disagreement over the standard that applies has caused confusion in various parts of the country.

Dow stands behind the opinion that the product can be left exposed in special circumstances and still meet all applicable building codes. This is borne out by the product’s use on perimeter sill plates and band joist headers. In those applications, exposed FROTH-PAK™ FS25 spray polyurethane foam insulation satisfies the requirements of Section R314.5.11 of the IRC code when applied up to 2-inches in thickness.