

DRAFTSTOPPING VS FIREBLOCKING

CLARIFYING THE DIFFERENCES THROUGH EXPLORING BUILDING TERMINOLOGY, CODE WORDING, AND INTENT

Draftstopping is often thought to be synonymous with fireblocking when encountering seams, gaps, and penetrations within the cavity of the walls found in single-family residential construction. Having a good understanding of the building code terminology, wording, and intent are all important factors in making the proper determination when enforcing the correct materials and locations needed to satisfy these important “life-safety” building code requirements.

Although both aspects of the building code are equally important, they are vastly different. Many believe that a *draftstop* refers to a material used to fill non-rated penetrations encompassing mechanical items such as wires and pipes through floor joists, top-plates, and studs prior to installing the insulation and drywall. The common misinterpretation is that it is required to prevent the flow of oxygen, therefore, preventing the spread of fire, smoke, and toxic gases to other areas of the building. “Draftstops” or “Draftstopping” is often thought to be “smoke stopping” and therefore the material to be used to seal these penetrations can simply be ordinary latex caulk or insulating spray polyurethane foam. This is not the case as the International Residential Code (IRC) does not have any terminology or wording pertaining to “smoke stopping” and/or sealing gaps, cracks, seams, or penetrations other than the “Draftstopping Requirements” in Section R502.12 – R502.13 and the “Fireblocking Requirements” in Section R602.8 – R602.8.1.2. Any additional gaps, cracks, seams or penetrations that are not specifically referenced in the building code are covered under the Model Energy Code (MEC) and may be filled simply as a barrier to air infiltration which provides better insulating benefits, energy savings, and also acts as a barrier to insects and rodents. (For additional air infiltration requirements, reference the most recent edition of the Model Energy Code as adopted by your local municipality)

Through exploring the definition of “draftstop”, “fireblock”, and the building code wording for each, we can distinguish the difference between “draftstopping” and “fireblocking” and the proper materials and locations to be used for each.

A **Draftstop**, by definition in the 2003 IRC, is a **material, device or construction installed to restrict the movement of air within open spaces of concealed areas of building components such as crawl spaces, floor-ceiling assemblies and attics**. According to section 502.12 in the 2003 IRC, draftstopping is required when there is useable space both above and below the concealed space of a floor/ceiling assembly. Draftstops shall be installed within this area so that the concealed space does not exceed 1,000 square feet. The draftstop shall be installed in such a manner that it divides the concealed space into approximately equal areas. Where the assembly is enclosed by a floor membrane above and a ceiling membrane below, draftstopping is required to be provided in the floor/ceiling assembly if the ceiling is suspended under the floor framing or if the floor framing is constructed of truss-type open-web or perforated members.

When determining the proper materials to be used, R502.12.1 requires draftstopping materials to be **no less than 1/2” gypsum board, 3/8” wood structural panels, 3/8” type 2M particle board, or other approved materials that are adequately supported within the concealed space**. These draftstopping materials are to be installed parallel to the floor framing members unless otherwise approved by the building official having jurisdiction.

Finally, if the draftstop material has been penetrated by the trades to run their utility cables or other penetrating items, **the integrity of all draftstops shall be maintained**. This means that the penetration or annular space around the penetrating item must be sealed with a material that is equal to or greater than the fire and/or structural resistance of the draftstop being penetrated.

Installation of the proper materials prescribed in the draftstopping code requirements are intended to break up broad expanses of unconditioned concealed space, to minimize the air flow, and to slow down the possible mitigation of flame and smoke within this open concealed space to additional fuel sources in other areas of the building in the tragic event of a fire.

Fireblocking is defined as **building materials installed to resist the free passage of flame to other areas of the building through concealed spaces**. Section R602.8 – R602.8.1.2 of the 2003 IRC require fireblocking to cut off all concealed draft openings (both vertical and horizontal) and to form an effective *fire* barrier between stories, and between a top story and the roof space.

In concealed spaces in stud wall cavities, partitions, and furred spaces, fireblocking needs to be installed at the ceiling and floor level and at 10’ intervals both horizontally and vertically to minimize draft flow and to suppress the mitigation of flame. Batts or blankets of mineral or glass fiber or other approved non-rigid materials should be used as fireblocking materials in walls constructed using parallel rows of studs or staggered rows of studs.

When encountering interconnections between concealed vertical and horizontal spaces such as soffits, drop ceilings, cove ceilings, and the concealed spaces between stair stringers at the top and bottom of the run, fireblocking materials need to be installed so that there is a barrier to prevent flame from spreading from the stud cavity or the floor/ceiling assembly to other concealed spaces, or to the attic and roof area above.

Section R602.8.1 describes the specific use and the minimum requirements for materials deemed acceptable for use as fireblocking materials. With the exception of materials to seal penetrations at ceiling and floor levels, fireblocking materials shall consist of **2” nominal lumber, or two thicknesses of 1” nominal lumber with broken lap joints. Wood structural panels may be used with a minimum of one thickness of 23/32” structural panel, but the joints or seams must be backed by the same 23/32” wood structural panel material to ensure the integrity of the seam or joint. One thickness of 3/4” particleboard may be used in the same application provided the joints are backed by the same 3/4” thickness of particleboard. Finally, one thickness of 1/2” gypsum board or 1/4” cement-based mill board may be used**. Batts or blankets of mineral wool or glass fiber or other approved materials shall be permitted as an acceptable fireblock material, provided they can be installed in such a way that the material is securely retained in place. Loose-fill insulation shall not be used as a fireblocking material unless the manufacturer provides documentation that shows the material was **specifically tested** in the form and manner intended for use to demonstrate its ability to remain in place and retard the spread of fire and hot gases.

Fireblocking also requires the protection of openings around vents, pipes, and ducts at ceiling and floor level with an approved material to **resist the free passage of flame and products of combustion (R602.8.4)**. Any time a penetration is made through a top-plate or previously installed “fireblock material” (for soffits, drop ceilings, etc.), the void or annular space needs to be sealed with a material that brings the fireblock back to the original integrity it maintained before it had been penetrated (R602.8.1.2 Fireblocking Integrity). There are many caulks tested to **ASTM-E136** (Test for Noncombustibility) or UL Listed **ASTM-E814** (Commercial Firestopping sealants for 1+ hour fire rated systems) that are tested to demonstrate they resume the integrity of the fireblock and that the material can resist the free passage of flame and products of combustion.

Finally, unfaced fiberglass batt insulation is required to fill the entire cross section of the wall cavity to a minimum height of 16” measured vertically. When piping, conduit, or similar obstructions are encountered, the insulation shall be packed tightly around the obstruction. Packing the unfaced insulation around both sides of the obstruction eliminates any extra concealed draft opening with in the stud cavity once the drywall is applied.

The fireblocking materials and the locations prescribed in the 2003 IRC provide passive fire protection and help to contain and slow the spread of flame, smoke and toxic gases. By building these components within the structure of the home and sealing the penetrations with approved fireblocking/firestopping sealants, the total involvement of a fire can be delayed allowing valuable time for fire fighters to respond and civilians to escape to safety.