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Conspectus's Tech Tips received the national Communications Award from the Construction Specifications Institute September 2011.

ABSTRACT:
Combustible construction can provide perfect paths through concealed spaces to allow fires to spread quickly and undetected. Fireblocking and draftstopping combine to minimize these perfect paths to help protect the property and the occupants.

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KEYWORDS:
Fireblocking, draftstopping, firestopping, lumber, plywood, particleboard, millboard, cement fiberboard, insulation, cockloft, concealed space

REFERENCES:
International Building Code, 2009 edition.
International Residential Code, 2009 edition.

Fireblocking and Draftstopping

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Background

In combustible construction, continuous concealed spaces provide a perfect path for fires to spread quickly. The evidence is abundant. YouTube includes 73 postings for fires involving common cocklofts that join multiple row homes. Searching YouTube for "row home fire" returns more than 1,000 results.

A cockloft is the open space within a roof structure, just below the roofing system, also known as a garret or attic. In row homes, roof framing normally spans between walls separating residential units. Older homes were constructed with masonry unit separation walls. The masonry stopped at the bottom of the roof framing. So, all residential units in each separate building shared a common cockloft.

There is more. Cocklofts are only one type of concealed space hazard in combustible construction.

The Codes

The International Building Code (IBC) Section 717 and the International Residential Code (IRC) Sections R302.11 and R302.12 address requirements for concealed combustible spaces. The code requires fireblocking and draftstopping to ensure concealed spaces are not continuous.

It is important to understand the distinct differences between fireblocking and draftstopping set by code. Construction dictionaries and common knowledge do not reflect the code distinctions.

- Fireblocking is a material installed to prevent or retard the spread of fire within or between vertical and horizontal concealed spaces.
- Draftstopping is a material installed to divide hollow floor and roof assemblies into multiple compartments.

So what are these materials that are installed as fireblocking and draftstopping? The codes prescribe the permitted materials.

That materials for each are not the same. Fireblocking requirements are more rigorous. Why? Fireblocking must resist a fire's direct attack. Draftstopping resists horizontal movement of a fire's hot gases. The code requirements for fireblocking and

Table 1

Permitted Material	Fireblocking	Draftstopping
2x lumber	1 layer	N/A
1x lumber	2 layers	1 layer
Plywood	23/32 inch	3/8 inch
Particleboard	3/4 inch	3/8 inch
Cement Millboard	1/4 inch	N/A
Cement Fiberboard	N/A	Any thickness
Batts & Blankets	Mineral Wool Mineral Fiber Unfaced Fiberglass	Mineral Wool Fiberglass

draftstopping were revised in the 2009 editions. Fireblocking material requirements were expanded. In the IRC, fireblocking and draftstopping requirements were revised and moved from Section 502 and 602 to Section 302.

Fireblocking

Permitted Materials: There are eight code permitted materials. Plus the code official may accept alternative materials. (See Table 1)

The code requires insulation materials to be installed to remain in place. This suggests mechanical fastening or an effective friction fit, especially if unfaced fiberglass is selected. Friction fit relies on studs that are uniformly spaced. Insulation is sized so it will be slightly compressed when installed in standard stud spaces. Careful cutting is required for insulation fitted to non-uniform stud spacing that is common in construction.

Required Locations:

- Concealed wall spaces vertically at the ceiling and floor levels.
- Concealed wall spaces horizontally at 10 foot centers.
- Connections between vertical walls and horizontal floor joists, floor trusses, soffits, dropped ceilings, and coves.
- Stairways between stair stringers at the top and bottom of each run.
- Annular space at ceiling and floor openings for penetrations such as pipes, ducts, and chimneys.
- Architectural trim, such as cornices, built out from exterior wall finishes where the trim or the trim's support framing is combustible.
- Spaces created by wood sleepers installed on masonry or concrete fire resistance rated floor assemblies.

Draftstopping

Permitted Materials: There are six code permitted materials with reduced thicknesses. (See Table 1)

Required Locations - R-1 and R-2 Residential Occupancies:

In floors and attics, above and in-line with the dwelling unit and sleeping unit separations.

Dwelling unit separations occur between individual residential units. Sleeping unit separations occur between hotel and motel guest rooms and between guest rooms and other spaces.

Required Locations - Other Occupancies:

- In floors, so each separate horizontal area does not exceed 1,000 sf.
- In attics, so each separate horizontal area does not exceed 3,000 sf.

An Alternative Solution: Install an NFPA 13R sprinklers throughout including the concealed combustible spaces for residential occupancies. For other occupancies, draftstopping is not required when a NFPA 13 sprinkler system is installed.

Conclusion

Visualize the completed construction to ensure all the concealed spaces in walls, floors, roofs, soffits, cornices, stairs, sleepers, and applied trim are properly protected. Pay attention to:

- Walls above dropped ceilings.
- Furring spaces.
- Tops of chase walls.
- Chase walls longer than 10 feet.

Ensure concealed combustible spaces are not continuous. Detail and specify fireblocking to prevent fire's uninhibited spread through concealed spaces. Show draftstopping locations on floor framing and roof framing drawings. Specify draftstopping materials and installations as a required component for wood framing.

CAUTION: Fireblocking and draftstopping do not substitute for firestopping required for penetrations through fire resistant assemblies.

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