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CODE/ EDITION: International Building Code 2006 (IBC),
International Residential Code 2006 (IRC)

SUBJECT: Fireblocking in Concealed Spaces of Combustible Assemblies

DISCUSSION:

Fireblocking (fireblock) are materials applied to combustible assemblies with objectives to retard airflow from feeding a fire and the free passage of flames, smoke or other products of combustion to other areas through concealed spaces. It is required by code to be applied in concealed locations of combustible assemblies.

Not to be confused, firestopping (firestop) is a practice of protecting penetrations that pass through fire-rated assemblies with materials that are approved for use in specific construction details that reflects the installed assemblies and meant to protect the rated penetrations to the same degree as the fire-rated assemblies that were penetrated.

CODE DEFINITION:

IBC 702.1, IRC R202 - FIREBLOCKING. Building materials installed to resist the free passage of flame to other areas of the building through concealed spaces.

CODE SUMMARY:

IBC 717.2 FIREBLOCKING. In combustible construction, fireblocking shall be installed to cut off concealed draft openings (both vertical and horizontal) and shall form an effective barrier between floors, between a top story and a roof or attic space. Fireblocking shall be installed in the locations specified in Sections IBC 717.2.2 through IBC 717.2.7.

IBC 717.2.1 Fireblocking materials. Fireblocking shall consist of 2-inch (51 mm) nominal lumber or two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints or one thickness of 0.719-inch (18.3 mm) wood structural panel with joints backed by 0.719-inch (18.3 mm) wood structural panel or one thickness of 0.75-inch (19 mm) particleboard with joints backed by 0.75-inch (19 mm) particleboard. Gypsum board, cement fiber board, batts or blankets of mineral wool, glass fiber or other approved materials installed in such a manner as to be securely retained in place shall be permitted as an acceptable fireblock. Batt or blankets of mineral or glass fiber or other approved nonrigid materials shall be permitted

for compliance with the 10-foot (3048 mm) horizontal fireblocking in walls constructed using parallel rows of studs or staggered studs. Loose-fill insulation material shall not be used as a fireblock unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases. The integrity of fireblocks shall be maintained.

IBC 717.2.1.1 Double stud walls. Batts or blankets of mineral or glass fiber or other approved nonrigid materials shall be allowed as fireblocking in walls constructed using parallel rows of studs or staggered studs.

IBC 717.2.2 Concealed wall spaces. Fireblocking shall be provided in concealed spaces of stud walls and partitions, including furred spaces, and parallel rows of studs or staggered studs, as follows:

1. Vertically at the ceiling and floor levels.
2. Horizontally at intervals not exceeding 10 feet (3048 mm).

IBC 717.2.3 Connections between horizontal and vertical spaces. Fireblocking shall be provided at interconnections between concealed vertical stud wall or partition spaces and concealed horizontal spaces created by an assembly of floor joists or trusses, and between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings, cove ceilings and similar locations.

IBC 717.2.4 Stairways. Fireblocking shall be provided in concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall also comply with Section 1009.5.3.

IBC 717.2.5 Ceiling and floor openings. Where annular space protection is provided in accordance with Exception 6 of Section 707.2, Exception 1 of Section 712.4.1.2, or Section 712.4.2, fireblocking shall be installed at openings around vents, pipes, ducts, chimneys and fireplaces at ceiling and floor levels, with an approved material to resist the free passage of flame and the products of combustion. Factory-built chimneys and fireplaces shall be fireblocked in accordance with UL 103 and UL 127.

IBC 717.2.6 Architectural trim. Fireblocking shall be installed within concealed spaces of exterior wall finish and other exterior architectural elements where permitted to be of combustible construction as specified in Section 1406 or where erected with combustible frames, at maximum intervals of 20 feet (6096 mm), so that there will be no open space exceeding 100 square feet (9.3 m²). Where wood furring strips are used, they shall be of approved wood of natural decay resistance or preservative-treated wood. If noncontinuous, such elements shall have closed ends, with at least 4 inches (102 mm) of separation between sections.

Exceptions:

1. Fireblocking of cornices is not required in single-family dwellings. Fireblocking of cornices of a two-family dwelling is required only at the line of dwelling unit separation.

2. Fireblocking shall not be required where installed on noncombustible framing and the face of the exterior wall finish exposed to the concealed space is covered by one of the following materials:
 - 2.1. Aluminum having a minimum thickness of 0.019 inch (0.5 mm).
 - 2.2. Corrosion-resistant steel having a base metal thickness not less than 0.016 inch (0.4 mm) at any point.
 - 2.3. Other approved noncombustible materials.

IBC 717.2.7 Concealed sleeper spaces. Where wood sleepers are used for laying wood flooring on masonry or concrete fire-resistance-rated floors, the space between the floor slab and the underside of the wood flooring shall be filled with an approved material to resist the free passage of flame and products of combustion or fireblocked in such a manner that there will be no open spaces under the flooring that will exceed 100 square feet (9.3 m²) in area and such space shall be filled solidly under permanent partitions so that there is no communication under the flooring between adjoining rooms.

Exceptions:

1. Fireblocking is not required for slab-on-grade floors in gymnasiums.
2. Fireblocking is required only at the juncture of each alternate lane and at the ends of each lane in a bowling facility.

IRC R602.8 Fireblocking required. Fireblocking shall be provided 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. Fireblocking shall be provided in wood-frame construction in the following locations:

1. In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs; as follows:
 - 1.1 Vertically at the ceiling and floor levels.
 - 1.2 Horizontally at intervals not exceeding 10 feet (3048 mm).
2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.
3. In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section R311.2.2.
4. At openings around vents, pipes, ducts, cables and wires at ceiling and floor level, with an approved material to resist the free passage of flame and products of combustion.
5. For the fireblocking of chimneys and fireplaces, see Section R1003.19.
6. Fireblocking of cornices of a two-family dwelling is required at the line of dwelling unit separation.

IRC R602.8.1 Materials. Except as provided in Section R602.8, Item 4, fireblocking shall consist of 2-inch (51 mm) nominal lumber, or two thicknesses of 1-inch (25.4 mm) nominal lumber with broken lap joints, or one thickness of 23/32-inch (19.8 mm) wood structural panels with joints backed by 23/32-inch (19.8 mm) wood structural panels or one thickness of 3/4-inch (19.1 mm) particleboard with joints backed by 3/4-inch (19.1 mm) particleboard, 1/2-inch (12.7 mm) gypsum board, or 1/4-inch (6.4 mm) cement-based millboard. Batts or blankets of mineral wool or glass fiber or other approved materials installed in such a manner

as to be securely retained in place shall be permitted as an acceptable fire block. Batts or blankets of mineral or glass fiber or other approved nonrigid materials shall be permitted for compliance with the 10 foot horizontal fireblocking in walls constructed using parallel rows of studs or staggered studs. Loose-fill insulation material shall not be used as a fire block unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.

IRC R602.8.1.1 Unfaced fiberglass. Unfaced fiberglass batt insulation used as fireblocking shall fill the entire cross section of the wall cavity to a minimum height of 16 inches (406 mm) measured vertically. When piping, conduit or similar obstructions are encountered; the insulation shall be packed tightly around the obstruction.

IRC R602.8.1.2 Fireblocking integrity. The integrity of all fireblocks shall be maintained.

REFERENCE: International Code Council Evaluation Service (ICC-ES)

ICC-ES Reports - Fireblock:

ESL-1058, ESL-1072, ESR-1040, ESR-1269, ESR-1387, ESR-1642, ESR-1926, ESR-1961, ESR-2092, ESR-2179, ESR-2316, ESR-2599, ESR-2909, ESR-3102, ESR-3118, ESR-3263, ESR-3302, ESR-3402, ESR-3466, ESR-3582, ESR-3600, ESR-3758, ESR-3885, ESR-3906.

ICC-ES Report #	Category	Product	Manufacturer
ESL-1058	Thermal and Moisture Protection and Annular Space Protection	840 Fireblock Insulating Foam Sealant and 840P Insulating Foam Sealant	Akkim Yapi Kimyasallari Sanayi ve Ticaret A.S.
ESL-1072	Thermal and Moisture Protection and Thermal Insulation	Mitee Seal Fireblock	Mitex Building Products, LLC
ESR-1040	Wood, Plastics and Composites and Laminated veneer Lumber	Versa-Lam and Versa-Rim Laminated Veneer Lumber	Boise Cascade Wood Products, LLC
ESR-1269	Concrete, Insulating Concrete Forming	Amvic Standard and Amvic Plus 3.30 Expanded Polystyrene Insulating Concrete Forms (ICFS)	Amvic Incorporated.
ESR-1387	Wood, Plastics and Composites, Laminated veneer Lumber, Laminated veneer Lumber, Parallel Strand Lumber, Laminated Strand Lumber.	Structural Composite Lumber: Timberstrand Laminated Strand Lumber (LSL); Parallam Parallel Strand Lumber(PSL); Microllam Laminated Veneer Lumber (LVL); Timberstrand LSL Rim Board; TJ Rim Board; and	Weyerhaeuser

ICC-ES Report #	Category	Product	Manufacturer
		Weyerhaeuser Rim Board.	
ESR-1642	Concrete, Insulating Concrete Forming	Logix Insulating Concrete Forms	Logix Insulated Concrete Forms LTD.
ESR-1926	Thermal and Moisture Protection and Annular Space Protection	Polyurethane Foam Sealants: Touch'n Seal Gun Foam II/ Touch'n Foam Pro All Purpose Gun Form; Touch'n Seal No Warp/Touch'n Foam Window and Door Foam; Touch'n Seal All Season Gun Foam, Touch'n Seal /Touch'n Foam Firebreak Technology Foam; Touch'n Seal Quick Cure/Touch'n Foam Triple Expansion; Touch'n Seal /Touch'n Foam Pro Quick Cure Canister Foam 10/16/23 Pound	Clayton Corporation
ESR-1961	Thermal and Moisture Protection, Thermal Insulation and Annular Space Protection	Great Stuff Gaps & Cracks, Great Stuff Multipurpose Black Insulating Foam Sealant, Great Stuff Fireblock, Great Stuff Window & Door, Great Stuff Big Gap Filler, Great Stuff Pro Gaps & Cracks, Contractor Grade Insulating Foam Sealant Gap Filler, Great Stuff Pro Window & Door, Contractor Grade Insulating Form Sealant Door & Window and Enerfoam.	The Dow Chemical Company
ESR-2092	Concrete, Insulating Concrete Forming	Nadura Integrated Building Technology Insulating Concrete Form (ICF) Wall System	Nadura Corporation
ESR-2179	Thermal and Moisture Protection and Annular Space Protection	Hilti CF-AS-CIP All Seasons Crack and Joint Insulation Form and Fireblock	Hilti, Inc.
ESR-2316	Specialties, Manufactured Fireplaces	Isokern Standard Models Fireplace and DM Chimney System: Isokern Magnum Fireplace Series Models; Isokern Fireplace with Fire-Lite Application;	Earthcore Industries, LLC
ESR-2599	Specialties, Manufactured Fireplaces	Fire Rock Modular Refractory Fireplace and Chimney Systems: Fire Rock	Fire Rock Products LLC

ICC-ES Report #	Category	Product	Manufacturer
		Conventional Fireplace Series; Fire Rock B-Vent Fireplace Series Models; Fire Rock Lite-Rock Fireplace Series Models; Fire Rock Vent Fireplace ; Outdoor Fireplace Series Models, and Fire Rock Rumford.	
ESR-2909	Wood, Plastics and Composites, Laminated veneer Lumber	Pacific Woodtech Laminated Veneer Lumber (LVL), and Pacific Woodtech 1 1/4-inchx 1.5 E Rim Board	Pacific Woodtech Corporation
ESR-3102	Thermal and Moisture Protection and Thermal Insulation	Enertite NM and Enertite IB-418 Open-Cell Spray Polyurethane Foam Insulations	BASF Corporation
ESR-3118	Thermal and Moisture Protection, Thermal Insulation and Annular Space Protection	Soudafoam Gap & Block	Soudal NV
ESR-3263	Thermal and Moisture Protection, Thermal Insulation and Annular Space Protection	Triggerfoam Pro Fire Block, Triggerfoam Pro Window and Door, Triggerfoam Pro All Season Foam Sealants	Dewalt
ESR-3302	Thermal and Moisture Protection, Thermal Insulation and Annular Space Protection	Tytan Professional Fire Block	Selena FM S.A
ESR-3402	Thermal and Moisture Protection, Thermal Insulation and Annular Space Protection	Red Devil Fireblock Form-N-Fill	Red Devil Inc.
ESR-3466	Concrete, Insulating Concrete Forming	Superform Insulating Concrete Forms (ICFs)	Superform Products LTD.
ESR-3582	Thermal and Moisture Protection, Thermal Insulation and Annular Space Protection	Seal Pro Gaps and Cracks	Service Partners, LLC
ESR-3600	Thermal and Moisture Protection, Thermal Insulation and Annular Space Protection	DAP Fireblock Form Polyurethane Form Sealant	DAP Products

ICC-ES Reports - Firestop:

ESR-1006, ESR-1255, ESR-2064, ESR-2213, ESR-2224, ER-2331, ESR-2996, ESR-3439, ESR-3462, ESR-3745.

ICC-ES Report #	Category	Product	Manufacturer
ESR-1006	Thermal and Moisture Protection, Thermal Insulation and Roof and Deck Insulation	Foam-Control Boards, Foam-Control with Perform Guard Boards and Foam-control with Perform Guard Boards and Foam-Control Geofoam Blocks	AFM Corporation
ESR-1255	Thermal and Moisture Protection and Mineral-Fiber Fireproofing	3M Fire Barrier Duct Wrap 615+ Blanket for Grease Duct Enclosure Assemblies	3M Fire Protection Products
ESR-2064	Thermal and Moisture Protection, Exterior Insulation and Finish Systems and Water-Drainage Exterior insulation and Finish System	Akroflex Barrier, Akroflex Water Managed (WW), and Akroflex Water Managed Plus (MM+) Exterior Insulation and Finish System (EIFS)	Omega Products International, Inc.
ESR-2213	Thermal and Moisture Protection and Mineral-Fiber Fireproofing	Firemaster Fastwrap XL Fire Protection System for Grease Ducts	Thermal Ceramics, Inc.
ESR-2224	Thermal and Moisture Protection and Mineral-Fiber Fireproofing	Fyrewrap Elite 1.5 and Max 2.0 Grease Duct Enclosure Assemblies	Unifrax I LLC
ER-2331	Insulation	Thermafiber Insulation Products	Thermafiber LLC
ESR-2996	Thermal and Moisture Protection and Firestopping	Passive Fire Protection Partners Through-Penetration Firestop Systems and Fire-Resistive Joint Systems	Passive Fire Protection Partners
ESR-3439	Thermal and Moisture Protection and Composite wall panels	ProdEX IGN Wall Panel Cladding System	Prodema, S.A.
ESR-3462	Thermal and Moisture Protection and Composite wall panels	Parklex Façade F Wall Panel Cladding System	Composites Gurea
ESR-3745	Cold-Formed Metal Framing and Structural Metal Stud Framing	Prescient Fire-Resistance Rated Wall and Floor-Ceiling Assemblies	Prescient Company, Inc.