2025 SPRAYFOAM Convention & Expo
Daytona Beach, FL February 9-12

Closed-Cell Spray Foam in Commercial Design

BY:

KEITH GRZYBOWSKI

Keith Grzybowski
Engineering Manager, Huntsman Building Solutions

I live in Nashville, Tennessee and primarily deal with SPF applications in commercial and residential construction in the U.S. market. I have been in the building products industry for 10+ years, and with Huntsman Building Solutions for the last 3.5 years. I respond frequently to technical questions related to product applications, building science, and building code compliance.

kgrzybowski@huntsmanbuilds.com
214-930-1470

SPFA Antitrust Policy

"Our policy is to comply with all federal, state and local laws, including the antitrust laws. It is expected that all company member representatives involved in SPFA activities and SPFA staff will be sensitive to the unique legal issues involving trade associations and, accordingly, will take all measures necessary to comply with U.S. antitrust laws and similar foreign competition laws."

It is a per se violation of the federal antitrust laws for competitors to agree on prices, limitation of supplies, allocation of customers or territory, or boycotts. "Per se" means that no legal defense can be used to mitigate this automatic violation.

Even an agreement by competitors that is for the good of society and our industry may be a violation of the antitrust laws if it could affect competition.

If a topic of antitrust concern is raised at any time during a meeting, note your objection for the record. If the topic continues to be discussed, you should leave the room immediately and contact SPFA's general counsel and your company's attorney for further guidance.

Ensure that every SPFA meeting, where members are present, has an agenda, the agenda is followed, and minutes are kept by SPFA staff of the proceedings.

Understanding and acting on the requirements of U.S. and foreign antitrust and competition laws sometimes can be difficult. If you have a question about the propriety of activities or discussions in SPFA, you are encouraged immediately to contact your company's legal counsel and SPFA management.

Commercial Applications

SPFA
SPRAY POLYURETHANE FOAM ALLIANCE

Interior Applications

Exterior Applications

Advantages of Exterior CI

- Moves control layers to exterior of the building
- Continuous thermal insulation
  - No thermal bridging
  - Required in IECC
- Monolithic air barrier
  - No seams, joints, or tape

Design Considerations

Closed cell SPF combines multiple control layers in a single application

- Insulation
- Air barrier
- Vapor retarder
- Water resistive barrier

Design Considerations

SPFA
SPRAY POLYURETHANE FOAM ALLIANCE

Brick Veneers

Metal Facades

SPFA
SPRAY POLYURETHANE FOAM ALLIANCE

Additional Tests

Exterior Walls of Type I to IV
- Requires NFPA 285

Assembly Specific Test
- Min/Maximum SPF thickness
- Cladding Type
- Window Details

Confirm in Manufacturer Code Compliance Reports

SPRAY POLYURETHANE FOAM ALLIANCE

"Wall Builder Table"

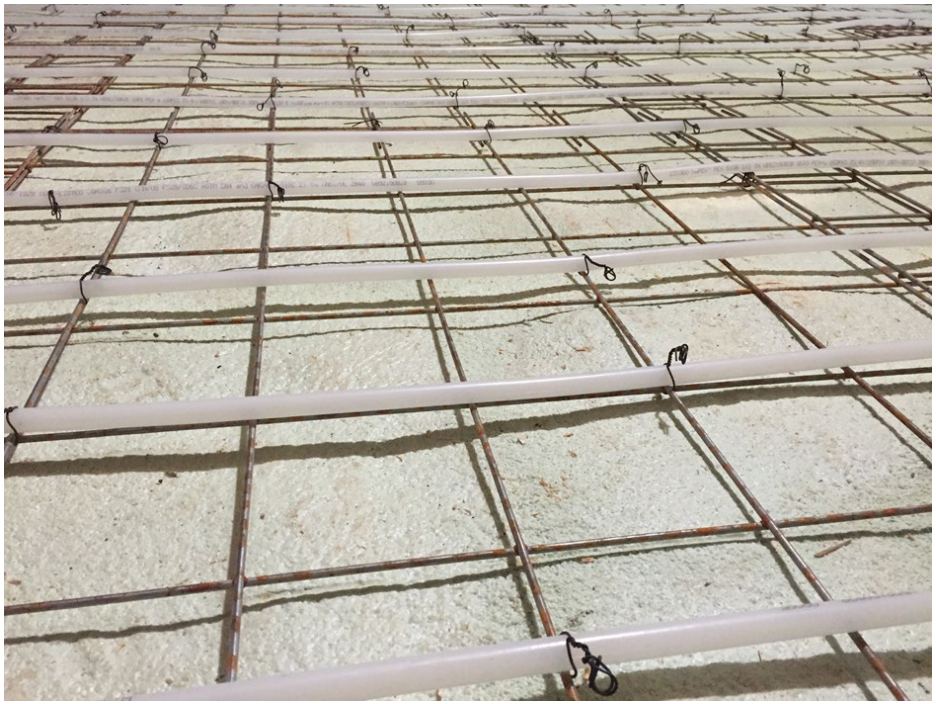
TABLE 4 – NFPA 285 COMPLYING EXTERIOR WALL ASSEMBLIES WITH HEATLOK® HFO INSTALLED ON THE EXTERIOR SIDE OF THE WALL ASSEMBLY

Wall Component	Materials
Base Wall System (BWS)- Use either 1, 2, or 3	1. Concrete Wall. 2. Concrete Masonry Wall. 3. 1 layer of $^5/_8$-inch-thick Type X gypsum wallboard installed on the interior side of minimum $3^5/_8$-inch deep, minimum 25-gauge equivalent thick steel studs spaced a maximum of 24 inches on center. Lateral bracing installed minimum every 4 foot vertically or as required.
Perimeter Fire Barrier System Use 1 or 2.	1. Perimeter fire barrier system complying with Section 715.4 of the IBC shall be installed, as applicable, to fill the void between the edge of the concreter floor slab and the interior surface of the exterior wall assembly. 2. Wall stud cavities shall be filled at each floor line with minimum 4 lb/ft^3 mineral wool friction fit between steel wall studs, attached with Z-clips or friction fit.
Interior Insulation – Use either 1, 2, 3, 4 or 5 or combinations of 3 with 4 or 3 with 5.	1. None 2. Full wall stud cavity depth or less of Heatlok® HFO Pro applied using exterior gypsum sheathing of BWS 3 as the substrate and covering the width of the cavity and the inside of the steel wall stud framing flange.[1] 3. Fiberglass batt insulation (faced or unfaced) 4. Mineral wool insulation (faced or unfaced)
Exterior Sheathing – use either 1 or 2	1. None (for BWS 1 or 2 above) 2. $^5/_8$-inch thick Type X exterior type gypsum sheathing (for BWS 3 above)
Exterior Insulation Use 1, 2 or 3	1. Maximum $3^1/_2$-inch thickness of Heatlok® HFO Pro (with Claddings 1-5, 2-inch maximum air gap between cladding and SPF). 2. Maximum 3-inch HeatLok HFO Pro SPF (with Claddings 6, 7 and 8. Horizontal purlin every 2 feet maximum, no vertical Z girts. Purlin depth 1-inch deeper than SPF thickness. 1-inch maximum air gap between cladding and SPF. 3. Maximum $3^3/_4$-inch HeatLok HFO Pro (with Claddings 9-18, use coating – 18 mils WFT DC315 with nine mils WFT Sherwin Williams Sher-Cryl HPA Topcoat with horizontal Z Girts 28 inches on center. 2-inch maximum air gap between cladding and SPF.
Exterior wall covering – use any item 1-20 with specific insulation or coating – read carefully. IMPORTANT Use 1-5 only with Exterior Insulation 1 Use 6, 7 and 8 only with Exterior Insulation 2 Use 9-18 only with Exterior	For use with Exterior Insulation 1 1. Brick – Standard type brick veneer anchors, installed a maximum of 24 inches on center, vertically on each stud with maximum 1-inch air gap between exterior insulation and brick. Brick to be standard nominal 4-inch thick clay brick installed in a running bond pattern using Type S mortar. 2. Stucco – Minimum ¾-inch thick, exterior plaster and lath. A secondary water resistive barrier (WRB) can be installed between the exterior insulation and lath. The secondary WRB shall not be full coverage asphalt or butyl based self-adhered membranes. 3. Minimum 2-inch thick natural stone (granite, limestone, marble or sandstone) Any standard non-open joint installation technique shall be used. 4. Minimum $1^1/_2$-inch thick concrete masonry unit (CMU), precast concrete or artificial cast stone. Any standard non-open jointed method shall be used. 5. Minimum $1^1/_4$-inch thick terra cotta non-open jointed. Any standard non-open jointed installation technique shall be used.

Parking Garages

- Foam and Thermal Barrier Paint = Approved Interior Finish per NFPA 286

Under-Slab Applications



Life Cycle Analysis

EPD	Embodied Carbon (1 m^2)	Yearly Carbon Emission Reductions through energy savings	GWP Payback Period	Lifetime Carbon Savings	Return on Invested Carbon
HFO Industry	4.16 kg	1556 kg CO2/year	7-8 years	>104 tCO2	8x
Open-Cell SPF	1.65 kg	1556 kg CO2/year	2-3 years	>112 tCO2	14x

- After offsetting its higher embodied carbon vs fiberglass, it then decarbonizes buildings throughout their lifetime.
- SPF insulation offers the best Return on Invested Carbon in the market.

Questions?

Thank You

SPFA
SPRAY POLYURETHANE FOAM ALLIANCE