JENSEN HUGHES
Advancing the Science of Safety

May 5, 2016

Mr. Jason Hoerter
Product Manager, Specialty Products
NCFI Polyurethanes
P.O. Box 1528
1515 Carter St.
Mt. Airy, NC 27030

RE: Various NFPA 285 Complying Exterior Wall Constructions
No.: 1JJB00035.000

Dear Mr. Hoerter:

This analysis provides a summary of various exterior wall constructions that will comply with NFPA 285 and that incorporate NCFI's closed cell, nominal 2.0 lb/ft^3 density, spray polyurethane foam plastic insulation (CC-SPF) and/or NCFI's open cell, nominal 0.5 lb/ft^3 density, spray polyurethane foam plastic insulation (OC-SPF). These are identified as:

- Closed cell – either InsulBloc® spray polyurethane foam plastic insulation (ID No. 11-017), InsulStar® spray polyurethane foam plastic insulation (ID No. 11-016), InsulStar® Plus spray polyurethane foam plastic insulation (ID No. 11-018), or ThermalStop™ spray polyurethane foam plastic insulation (ID No. 11-015);
- Open cell – Sealite™ spray polyurethane foam plastic insulation (ID No. 12-002); and,
- Open cell – Sealite™ OCX spray polyurethane foam plastic insulation (ID No. 12-005).

Section 2603.5.5 of the International Building Code (2003, 2006, 2009, and 2012 Editions) requires that exterior wall systems on buildings of any height in Types I, II, III, and IV construction that incorporate foam plastic insulation shall meet the requirements of NFPA 285 "Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components."

NCFI has performed several NFPA 285 fire tests on exterior wall systems that have incorporated the above spray polyurethane foam plastic insulations. These tests are reported in:

- Southwest Research Institute Final Report No. 01.14431.01.108[1], dated October 12, 2009;
- Intertek Testing Services NA, Inc. Final Report No. 100570865SAT-001m dated January 30, 2012; and,
- Intertek Testing Services NA, Inc. Final Report No. 101432261SAT-004_Rev. 1 dated March 6, 2014.

Based on the results of these tests, additional small-scale fire tests and my experience with the NFPA 285 fire test, it is my judgment that the various configurations of exterior walls described in the attached tables will meet the performance requirements of NFPA 285.

O: +1 410-737-8677
F: +1 410-737-8688

3610 Commerce Drive | Suite 817
Baltimore, MD 21227 USA

jensenhughes.com

This analysis is based on the specific construction materials installed in the manner described in the referenced test report(s). Changes or modifications to the construction and/or materials used in the tested assembly may result in a different fire performance and may change this analysis.

This analysis does not address performance characteristics such as weatherability, durability, or structural issues

I hope that this information is of assistance and if you have any questions, please feel free to contact me.

Sincerely,

JENSEN HUGHES

Jesse J. Beitel
Senior Scientist/Principal

Table I. NFPA 285 Complying Walls with NCFI CC-SPF on Exterior

Wall Component	Materials
Base wall system – Use either 1, 2 or 3	1 – Concrete wall – minimum 2-inch thick 2 – Concrete Masonry wall 3 – One layer – ⅝-inch thick Type X Gypsum wallboard on interior, installed over steel studs: minimum 3⅝-inch depth, minimum 20-gauge at a maximum of 24-inch OC with lateral bracing every 4 ft. vertically
Floorline Firestopping	4 lb/cu ft. mineral wool (e.g., Thermafiber) in each stud cavity and at each floorline – attached with Z-clips or equivalent
Cavity Insulation – Use either 1, 2, 3, or 4	1 – None 2 – Full cavity depth or less of InsulBloc®, InsulStar®, InsulStar® Plus or ThermalStop™ closed cell (2.0 lb/ft^3) spray polyurethane foam applied using sheathing as substrate and covering the width of the cavity and inside the stud flange 3 – Full cavity depth or less of Sealite™ (ID No. 12-002) or Sealite™ OCX (ID No. 12-005) open cell (0.5 lb/ft^3) spray polyurethane foam applied using sheathing as substrate and covering the width of the cavity and inside the stud flange 4 – Any noncombustible insulation (if batts, can be either faced or unfaced)
Exterior sheathing – Use either 1 or 2	1 – ½-inch thick, exterior type gypsum sheathing 2 – ⅝-inch thick, exterior type gypsum sheathing
Exterior insulation – Use either 1 or 2	1 – None 2 – InsulBloc®, InsulStar®, InsulStar® Plus or ThermalStop™ –Total thickness to be a maximum of nominal 5 inches.
Exterior Veneer – Use either 1, 2, 3 or 4	1 – Brick – Brick veneer anchors – standard types – installed maximum 24 inches OC vertically on each stud – Maximum 2-inch air gap between exterior insulation and brick – Standard nominal 4-inch thick, clay brick 2 – Stucco – Minimum ¾-inch thick, exterior cement plaster and lath. A secondary water-resistive barrier can be installed between the exterior insulation and the lath. The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes. 3 – Minimum 2-inch thick Limestone, natural stone or minimum 1½-inch thick cast artificial stone. Any standard non-open-jointed installation technique such as ship-lap, etc. can be used. 4 – Terracotta cladding – Use any terracotta cladding system in which the terracotta is minimum 1¼-inch. Any standard non-open-jointed installation technique such as ship-lap, etc. can be used.

Table II. NFPA 285 Complying Walls – CC-SPF or OC-SPF in Wall Cavity Only

Wall Component	Materials
Base wall system – Use either: 1 with interior, steel studs, minimum 3⅝-inch depth, minimum 20-gauge at a maximum of 24-inch on center with lateral bracing every 4 ft. vertically, or 2 or 3	1 – 1 layer of ⅝-inch thick Type X exterior gypsum sheathing installed on the exterior side of the steel studs 2 – Concrete wall – minimum 2-inch thick 3 – Concrete Masonry wall
Floorline Firestopping	4 lb/ft^3 mineral wool (e.g., Thermafiber) friction fit in each wall stud cavity at each floorline.
Cavity Insulation – Use either 1, 2, or 3 or any combination of 2 and 4 or any combination of 3 and 4	1 – None 2 – Full cavity depth or less of InsulBloc®, InsulStar®, InsulStar® Plus or ThermalStop™ closed cell (2.0 lb/ft^3) spray polyurethane foam applied using sheathing or concrete or masonry as substrate and covering the width of the cavity and inside the stud flange 3 – Full cavity depth or less of Sealite™ ™ (ID No. 12-002) or Sealite™ OCX (ID No. 12-005) open cell (0.5 lb/ft^3) spray polyurethane foam applied using sheathing or concrete or masonry as substrate and covering the width of the cavity and inside the stud flange 4 – Any noncombustible insulation (if batts, can be either faced or unfaced)
Interior gypsum wallboard	Minimum ⅝-inch thick Type X exterior type gypsum wallboard
Exterior Wall Covering – Use either 1, 2 or 3	1 – Any non-combustible exterior wall covering material 2 – Any combustible exterior wall covering system that has successfully been tested in accordance with NFPA 285 3 – Any combustible exterior wall covering system up to a maximum wall height of 40 ft. above grade plane. If the combustible material is fire-retardant treated wood, the maximum wall height can be 60 ft. above grade plane 4 – For base wall 2 or 3, a covering is optional but not required. Use an Exterior wall covering as described in 1, 2 or 3 above.