NFPA 285
Fire Propagation Test Summary

Scope Statement
The CavityComplete® Wall System has successfully passed NFPA 285 which is a 2-story, intermediate scale, 30 minute fire test used to evaluate the fire propagation characteristics of exterior non-load-bearing wall assemblies that are constructed using combustible materials, or that incorporate combustible components within a wall assembly. With combustible components such as foam plastic insulation, air/water resistive barriers, or combustible cladding panels in or on the wall, the test standard is generally applicable in situations where the building code requires non-combustible exterior walls such as International Building Code construction types I, II, III or IV. The test evaluates the ability of the wall assembly:

- to resist flame propagation over the exterior face of the wall, and
- to resist vertical flame propagation within the combustible core from one story to the next, and
- to resist vertical flame propagation over the interior surface of the wall assembly from one story to the next, and
- to resist lateral flame propagation from the compartment of fire origin to adjacent compartments or spaces.

Specimen Description
Test Specimen Size: Approximately 14' x 18'

Base Wall Steel Stud Framing
The base wall consisted of 18' long, 3-5/8" deep, 18 gauge galvanized steel studs 24" o.c. Base track for the wall was 14' long, 16 gauge galvanized steel. Studs secured to the track with Fastenal #8 x 1" long wafer head self-drilling screws. Stud cavities were empty, uninsulated.

Interior Gypsum Cladding
5/8" type X gypsum board secured to the steel stud framing with Fastenal #10 x 1-1/4" long flat head self-drilling screws with a nominal spacing of 8" on the perimeter and 12" in the field. All joints were taped with USG Sheetrock paper joint tape, and spackled with USG Sheetrock Joint Compound.

Exterior Gypsum Sheathing
5/8" USG Securock® exterior gypsum sheathing, secured to the steel stud framing with Fastenal #10 x 1-1/4" long flat head self-drilling screws with a nominal spacing of 8" on the perimeter and 12" in the field.

Air/Water Resistive Barrier, Tremco® ExoAir® 230
Tremco® Dymonic® 100 polyurethane sealant was applied to each fastener location as well as each sheathing joint. Sealant was spread with a putty knife to achieve full coverage over each fastener and each joint. After the sealant, Tremco® ExoAir® 230, permeable air/water resistive barrier was roller applied over the full exterior surface and around the window opening perimeter, with a nominal thickness of 0.060".

Window Opening Safing Insulation, Owens Corning® Thermafiber® Safing
The window was “picture framed” on the 2 jamb sides and the sill with two pieces of 4" thick, 4 lb. density Thermafiber® Safing mineral wool insulation, compressed into the 6" space between the exterior gypsum coated with ExoAir® 230 and the back of the brick veneer (25% compression).

Window Opening Lintel/Shelf Angle
The head of the window was fully sealed from the face of the steel stud framing to the outer face of the masonry veneer with a 4" vertical leg x 9" horizontal leg, 1/2" thick, steel angle. Mineral wool fire safing in both side jams was installed snugly against the bottom side of the steel angle.
Flashing and Weep Protection,
Mortar Net Solutions™ TotalFlash®
Through wall flashing was installed across the entire width at the base of the wall, and the window opening. It consisted of Mortar Net Solutions™ TotalFlash® fabricated with 18" wide Tremco® ExoAir® TWF (rubberized asphalt through wall flashing membrane), factory mounted termination bar, drip edge and 90% open drainage mesh. Prior to installation TotalFlash® MPE-1 sealant/adhesive was applied to the self-adhering surface of the flashing assembly. Once installed, #12 x 2" long self-drilling hex head fasteners with neoprene washer were installed through the termination bar into each stud 24" o.c. After installation of the exterior insulation, 1/2" thick x 6" wide drainage mat was placed between the insulation and the exterior masonry veneer. Mortar Net Solutions™ WeepVent head joint vents were installed 24" o.c. in the brick head joints across the lintel.

Rigid Exterior Insulation, Owens Corning®
FOAMULAR® 250 Extruded Polystyrene (XPS)
2 layers, 2" thick x 24" wide, 96" long, installed using screw/washer and brick veneer anchors/washers as described under those product lines.

Air/Water Sealing Washers/Screws,
Rodenhouse Inc. Thermal-Grip®/Grip-Deck™
The first layer of FOAMULAR® 250 was secured through to the steel stud framing using Rodenhouse, Inc., 2" diameter Thermal-Grip® ci prong washers on 3-1/2" long Grip-Deck™ self-drilling screws, 2 fasteners at mid height per panel. The second layer was preliminarily secured using Thermal-Grip® ci prong washers with 6" long Grip-Deck screws.

Masonry Veneer Anchors, Heckmann Building Products, Inc., Pos-I-Tie®
Temporary securing of the FOAMULAR® 250 XPS Insulation was followed by the installation of Heckmann Building Products, Inc., Pos-I-Tie® Brick Veneer Anchoring System, barrel style, 4-1/2" long, self-drilling through into the steel stud framing. Installed in every stud, and 16" o.c. vertically, with Rodenhouse, Inc., 2" diameter Thermal-Grip® brick-tie washers. The exterior loop end of each brick anchor was capped with a Pos-I-Tie® ThermalClip® to connect the brick tie to the pintle wire tie that extended into the bed joints of the masonry veneer.

Masonry Veneer
3-5/8" x 2-1/4" x 7-5/8" grade “A” brick, separated from the FOAMULAR® 250 XPS insulation by a 2" wide air space. Open head joint weep holes were placed every third brick joint in the first course of brick at the base of the wall and over the window opening.

Test Results Summary and Code Compliance
NFPA 285
The International Building Code requires NFPA 285 test compliance for many type I, II, III and IV building construction applications including in lieu of otherwise required fireblocking behind exterior wall coverings, for water resistive barriers greater than 40’ above grade, for metal composite panels, for high pressure laminate panels, for rooftop mechanical equipment screens, for foam plastic insulated exterior walls greater than one story in height, and for fiber reinforced polymer finishes.

The CavityComplete® Wall System for Steel Stud with Masonry Veneer, as described in this technical bulletin, successfully completed the 30 minute NFPA 285 fire exposure/propagation test and passed as described in the test results table. See the NFPA 285 design guide technical bulletin for variations of this assembly. Also see www.CavityComplete.com and www.ul.com in the Underwriters Laboratories Online Certifications Directory, UL File No. EWS0008.
NFPA 285 TEST RESULTS,  
CavityComplete® Wall System

<table>
<thead>
<tr>
<th>Mandatory Temperature Limitations</th>
<th>Thermocouple No.</th>
<th>Thermocouple Locations</th>
<th>Pass/Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000°F maximum</td>
<td>11 and 14-17</td>
<td>Exterior face, centered above window opening</td>
<td>PASS</td>
</tr>
<tr>
<td>1000°F maximum</td>
<td>18-19, 28 and 31-40</td>
<td>Air space behind the brick, centered above window</td>
<td>PASS</td>
</tr>
<tr>
<td>750°F above ambient</td>
<td>55-67</td>
<td>Core of the continuous foam plastic insulation, horizontally 10' above the window opening, and vertically 4' left and 4' right of the vertical centerline</td>
<td>PASS</td>
</tr>
<tr>
<td>500°F above ambient</td>
<td>49-54</td>
<td>Second story, interior wall surface, non-fire exposure room</td>
<td>PASS</td>
</tr>
</tbody>
</table>

Mandatory Visual Observations
- Flames must not reach 10 ft. above the window opening. PASS
- Flames must not reach a lateral distance of 5 ft. from the vertical centerline. PASS
- Flames must not propagate beyond the limits of the first story fire exposure room. PASS
- No visible flaming may occur in the second story non-fire room. PASS

The CavityComplete® Wall System excludes the masonry veneer, steel studs and interior and exterior gypsum board. A detailed list of the components is available at www.CavityComplete.com.