Factors to Consider When Choosing Insulation for Masonry Cavity Walls

The Masonry Advisory Council (MAC) notes, “Masonry cavity walls are used extensively throughout the United States in all types of buildings. The primary reasons for their popularity are superior resistance to rain penetration, excellent thermal properties, excellent resistance to sound transmission and high resistance to fire.”

Because an un-obstructed air space is crucial for managing moisture in cavity walls, the TMS 402-11 Building Code Requirements for Masonry Structures (section 6.2.2.8.2) calls for a minimum 1-inch air space within the wall assembly.

This requirement has important implications for choosing insulation.

SPECIFYING INSULATION IN MASONRY CAVITY WALLS

Various types of insulation have been used in masonry cavity walls, including rigid foam boards like polyisocyanurate (polyiso) and extruded polystyrene (XPS), as well as spray polyurethane foam (SPF) and mineral wool. The MAC recommends polyiso as the “most beneficial” insulation.

Polyiso – especially Hunter Xci polyiso continuous insulation – comes out on top for four reasons:

- Saves time and money
- Thermal performance
- Fire ratings
- Resistance to solvents

Thermal Performance

Xci polyiso offers increased R-Value per inch vs. mineral fiber, XPS or EPS insulation options, enabling contractors to easily meet today’s code-required energy efficiency requirements without filling the entire cavity with insulation, or creating need to expand the cavity. Of note, Hunter Xci Foil provides R-6.5 per inch thickness.

Fire Ratings

Xci wall insulations have been tested for NFPA 285 compliance in numerous wall assemblies, including CMU, concrete, steel stud and fire retardant treated walls, and with many cladding types and other assembly components. Additionally, due to polyiso’s fire performance characteristics, special header details in windows and openings are not required to pass NFPA 285 testing – further simplifying construction and saving money.

Resistance to Solvents

Masonry cavity wall designs often include materials with petroleum-based solvents – such as adhesives, preservative coatings and waterproofing. Such solvents can degrade other rigid foam insulations, but do not affect Xci polyiso insulation.

CONCLUSION

Many building professionals know polyiso as a roof insulation, but considering it for use in walls – including masonry cavity walls – can help to meet continuous insulation requirements while saving time and money on the overall wall assembly.
The fast-growing Austin, Texas, metro area added nearly 300,000 people from 2010 to 2015, and the region remains one of the top 10 for growth in the U.S. The Manor Independent School District in suburban Manor, Texas, experiences the Austin region’s growth impacts first hand as it prepares to double its student count in the next five years from 9,000 to 18,000 students, reports KXAN TV. To serve the larger student body, the district added a new Manor High School on an adjacent campus in 2017 to supplement the existing high school.

One challenge the building team faced was providing continuous insulation while also meeting fire requirements under NFPA 285, Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components. “The project was originally specified with XPS insulation, but swapping that out for Hunter Panels Xci CG polyiso improved the thermal performance, and met NFPA 285,” says Darren Butler, president of NVLP Materials. “The price did not change when switching to Xci CG for the contractor and everyone was happy and code compliant.”

Hunter Panels Xci CG is a high-thermal rigid insulation panel composed of closed cell polyisocyanurate foam with premium performance coated glass facers on both sides. This product passed NFPA 285 testing in numerous wall assemblies including the one used at Manor High School that was comprised of stone masonry and metal cladding over steel stud framing and exterior gypsum sheathing.

In addition, Xci CG “is a more vapor-open product than XPS, which allows buildings to dry out if necessary,” says Butler. “The durable coated glass (CG) facers also produce a more wear-resistant insulation when moved around the jobsite.” Scott German, senior project manager with Balfour Beatty, general contractor says, “Hunter Xci CG really fit the bill with this project: exceptional thermal performance, NFPA 285 compliant, and easy for our crews to install – all in one panel!”

**MANOR HIGH SCHOOL CASE STUDY**

| Job Name: | Manor High School |
| Location: | Manor, Texas |
| Product: | Hunter Panels Xci CG 1.7” polyiso - 90,000 sf |
| Contractor: | Alpha Insulation & Waterproofing, Austin, Texas |
| Architect: | Perkins + Will, Austin, Texas |
| General Contractor: | Balfour Beatty, Austin, Texas |
| Job Insights: | Changing insulation spec from extruded polystyrene (XPS) to Hunter Xci CG polyiso provided better thermal performance and met NFPA 285 fire requirements |
WORKING WITH BRICK FAQS

Q. How does polyiso perform with regard to moisture?
A. Polyiso has excellent moisture performance. The foam cores of Xci continuous insulation products have a moisture vapor permeance of less than 1% and a water absorption rate of less than 0.1% by volume. Multiple facer options give added design flexibility.

Q. Does a foil facer on polyiso contribute to R-value and reflective R-value?
A. Yes. Foil faced polyiso products offer higher R-values than other foam board insulations, including XPS, EPS, and polyiso products with permeable mat facers. Per ASHRAE, the reflectivity of foil facers can contribute additional R-value when combined with dead air space.

Q. What is the proper means for attachment of polyiso between brick ties?
A. Polyiso can be can be mechanically attached, adhered or friction fit between brick ties.

ADDITIONAL CAVITY WALL RESOURCES

For tips on working with Hunter Xci polyiso insulation in masonry cavity walls, see these resources at www.hunterpanels.com:

- Xci Advantage Sheet provides a concise summary of the benefits of Xci polyiso insulation in masonry cavity walls

- Hunter Panels’ Build-a-Wall info sheets for building NFPA 285 compliant wall assemblies using Hunter Xci products

- Installation guidelines for Xci polyiso insulation (see pages 12 – 15 for brick ties)

- Dr. M. Steven Doggett study summary sheet on the building science of ventilated rainscreens