

 **Spec-Thermal**[®]
PRE-INSULATED MASONRY SYSTEM



 **CONCRETE
PRODUCTS
GROUP**

**HI-R H
HI-R-H Half High**

HI-R-H Product Line

Spec-Thermal HI-R-H and HI-R-H HALF HIGH are pre-insulated fully grouted masonry wall systems that offer superior thermal performance. Throw out your expectation that masonry cannot meet stringent Code requirements; these products are game changers.

Applications

- Double exposed single wythe masonry walls with durable architectural finishes for conditioned spaces in all Climate Zones.
- Single wythe walls for conditioned spaces in all Climate Zones with furring/wallboard and/or interior or exterior insulation.
- Load-bearing walls above and/or below grade.



Thermal Performance

- Two part offset interlocking 3.5" or 4" insulation insert with lapped joints.
- The HI-R H wall systems minimize thermal bridging and use thick, interlocking Korfil® insulation inserts and interior exposed thermal mass to provide excellent energy conservation.
- Superior thermal performance to HI-R products.

Fully Grouted Wall System

- Barrier wall performance resists moisture penetration and condensation issues with use of integral water repellent in block and mortar and post-applied sealant.
- Four hour fire rating is typical. Check with manufacturer for details.
- No additional air barrier or vapor retarder is required with fully grouted masonry walls (assumes use of integral water repellent in unit and mortar)
- Great choice for structures designed to be resilient against natural hazards.
- Great choice for demanding applications requiring extensive reinforcement.

Construction Efficiency and Value

- Shape eases placement even with tight reinforcement spacing.
- No modification to stretcher unit required for bond beam construction.
- Utilities (plumbing and electrical) readily fit in unit cores and horizontal voids.
- Single trade installs interior and exterior finishes, structure and insulation in one step.
- Unit Width: 12" (10" in some regions only - please check with your representative).

Project Example: Sandy Creek Bus Garage



Project Location:

- Sandy Creek is a village located in northern Oswego County in Upstate New York.

Design Objective:

- Match the historic character of a nearby traditional brick school while providing a state of the art, durable, low maintenance layout to service and maintain buses running in a challenging northern climate.

Energy Code Requirements:

- The Energy Conservation Code of New York State requires that above grade mass walls must not exceed a U-Factor of U-0.090 for Climate Zone 5, the applicable zone for this project.

Products Selected:

- HI-R-H and HI-R-H Half High Units Along with HI-R-H Corner/Jamb Units in Full and Half High dimensions. Pre-Fabricated Masonry Lintels were also used on the project.

Design Team:

- Architects: King + King Architects, Partner Kerry Tarolli and Project Manager Michael James.
Structural Engineers: St. Germain & Aupperle Consulting Engineers, Rich Aupperle, PE and
Project Engineer: John LaValle.

Construction Team:

- Construction Management: Todd LaBarr and Fred Langworthy of Watchdog Building Partners.
General Contractor: DiPasquale Construction, Bill Matuszczak, Field Superintendent

HI-R-H units were used to provide an insulated foundation



Utility routing in cores of HI-R-H units



Double exposed masonry for interior beauty and durability



Demonstrating Energy Code Compliance with HI-R-H Products

The HI-R-H product family comply with Energy Code requirements using U-Factor based compliance methods.

Unlike the R-Value prescriptive method, which only considers the R-Value of the insulation, the other prescriptive approaches that are based on the U-Factor of the wall assembly do not require continuous insulation.

This is also true of trade-off approaches using hand calculations or software programs like COMcheck, or whole building modeling, which also consider the performance of the wall assembly as a whole. The key measure is the U-Factor for the wall assembly (along with those of the other building envelope components, depending on the compliance method that is used).



R-Values and U-Factors for HI-R and HI-R-H Masonry Units (stretcher units only)

| Product (grouted cells) | Density (pounds per cubic foot) | | | | |
|---|------------------------------------|--------------------|--------------------|--------------------|--------------------|
| | 95 | 105 | 115 | 125 | 135 |
| HI-R Two Webs, 2.5 inch insert 8-8-16 | R-10.00 U-0.10 | R-9.07 U-0.110 | R-8.18 U-0.122 | R-7.36 U-0.136 | R-6.59 U-0.152 |
| HI-R Two Webs, 2.5 inch insert 10-8-16 | R-11.82 U-0.085 | R-10.82 U-0.092 | R-9.85 U-0.10 | R-8.94 U-0.11 | R-8.08 U-0.124 |
| HI-R and HI-R Half High Two Webs, 2.5 inch insert 12-8-16/12-4-16 | R-12.58 U-0.079 | R-11.56 U-0.086 | R-10.57 U-0.095 | R-9.62 U-0.104 | R-8.72 U-0.115 |
| HI-R-H One Web, 3.5 inch insert 10-8-16* | R-15.11 U-0.066 | R-13.70 U-0.073 | R-12.57 U-0.079 | R-11.37 U-0.088 | R-10.17 U-0.098 |
| HI-R-H One Web, 3.5 inch insert 12-8-16 | R-16.32 U-0.061 | R-14.98 U-0.067 | R-13.74 U-0.073 | R-12.50 U-0.080 | R-11.25 U-0.089 |
| HI-R-H One Web, 4 inch insert 12-8-16 | R-17.56 0.057 | R-16.12 U-0.062 | R-14.78 U-0.068 | R-13.45 U-0.074 | R-12.11 U-0.083 |
| HI-R-H Half High One Web, 4 inch insert 12-4-16 | R-17.87 U-0.056 | R-16.40 U-0.061 | R-15.04 U-0.066 | R-13.69 U-0.073 | R-12.32 U-0.081 |

* 8" HI-R has limited grout space and is not typically specified.

** Check with your local CPG representative; 10" version has regional availability only.

*** Available densities vary by region; please check with your manufacturer.

For reference, the 2015 IECC prescriptive requirements for mass walls for commercial buildings require that the U-Factor for mass walls not exceed the following values per climate zone:

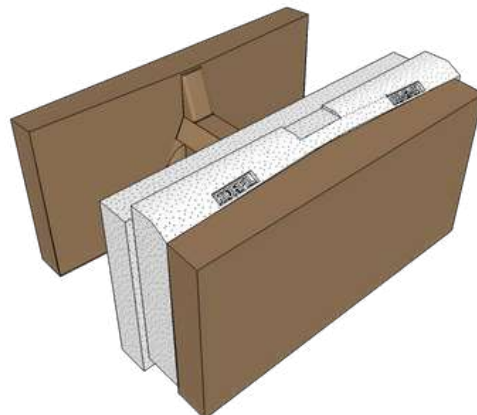
| Climate Zone | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------|---------|---------|---------|---------|---------|---------|---------|---------|
| U-Factor | U-0.151 | U-0.151 | U-0.123 | U-0.104 | U-0.090 | U-0.080 | U-0.071 | U-0.061 |
| U-Factor (R) | U-0.151 | U-0.123 | U-0.104 | U-0.090 | U-0.080 | U-0.071 | U-0.061 | U-0.061 |

Thermal Properties

HI-R-H is a single web pre-insulated masonry unit suitable for fully grouted walls. Typically, it is the most cost-effective pre-insulated option.

Features:

- Unit Dimensions: 12x8x16 nominal (10x8x16 available in some markets)
- Insulation Options: 3.5" or 4" Insulation Inserts are available - 3.5" for greater cost efficiency, 4" (for 12x8x16 only) where needed for greater performance
- Offered with full range of masonry textures and colors
- When made with Spec-Brik Colors the product is called Spec-Brik Jumbo HI-R-H.



12x8x16 HI-R-H (Grouted)

| 3.5 inch insulation inch insert | Density (pcf) | | | | |
|---------------------------------|---------------|-------|-------|-------|-------|
| | 95 | 105 | 115 | 125 | 135 |
| R _t Value | 16.32 | 14.98 | 13.74 | 12.50 | 11.25 |
| U Factor | 0.061 | 0.067 | 0.073 | 0.080 | 0.089 |
| Heat Capacity | 20.10 | 20.80 | 21.50 | 22.10 | 22.80 |
| Equivalent Thickness | 9.60 | 9.60 | 9.60 | 9.60 | 9.60 |

12x8x16 HI-R-H (Grouted)

| 4 inch insulation inch insert | Density (pcf) | | | | |
|-------------------------------|---------------|-------|-------|-------|-------|
| | 95 | 105 | 115 | 125 | 135 |
| R _t Value | 17.56 | 16.12 | 14.78 | 13.45 | 12.11 |
| U Factor | 0.057 | 0.062 | 0.068 | 0.074 | 0.083 |
| Heat Capacity | 13.26 | 14.65 | 16.05 | 17.44 | 18.84 |
| Equivalent Thickness | 8.06 | 8.06 | 8.06 | 8.06 | 8.06 |

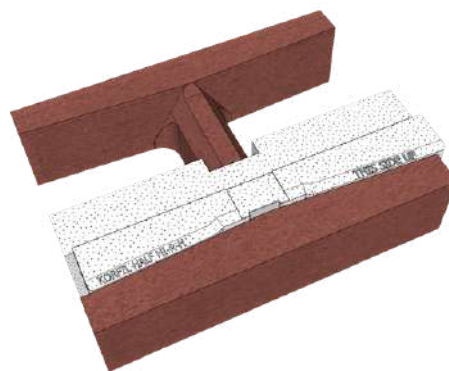
Check with your local manufacturer to confirm the density of concrete block they offer. Since this depends on locally available materials, density offerings will vary by location. Thermal calculations should take into account all components of the wall assembly, including fittings used at joints, jambs, corners, etc.

Thermal Properties

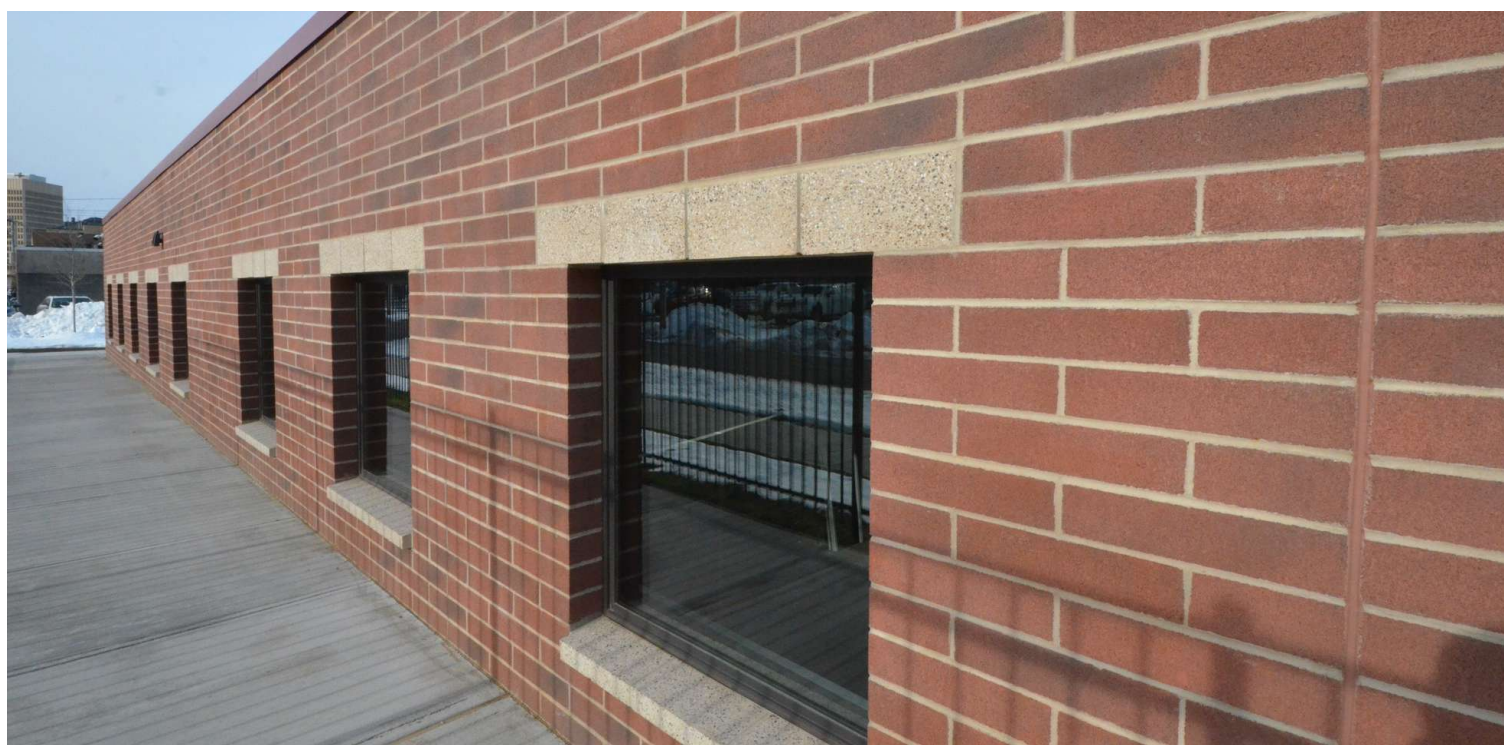
HI-R-H HALF HIGH is a single web pre-insulated masonry unit suitable for fully grouted walls that has a 4" x 16" face dimension

Features:

- Available unit dimensions: 12"x4"x16" nominal
- Great for pre-insulated walls where brick aesthetics are desired.
- When made with SPEC-BRIK Colors, the product is called SPEC-BRIK HI-R-H.



| 12x4x16 HI-R-H HALF HIGH/SPEC-BRIK HI-R-H | | | | | |
|---|---------------|-------|-------|-------|-------|
| 4 Inch Insulation Insert | Density (pcf) | | | | |
| | 95 | 105 | 115 | 125 | 135 |
| R _t Value | 17.87 | 16.40 | 15.04 | 13.69 | 12.32 |
| U Factor | 0.056 | 0.061 | 0.066 | 0.073 | 0.081 |
| Heat Capacity | 11.59 | 12.81 | 14.03 | 15.25 | 16.47 |
| Equivalent Thickness | 7.88 | 7.88 | 7.88 | 7.88 | 7.88 |

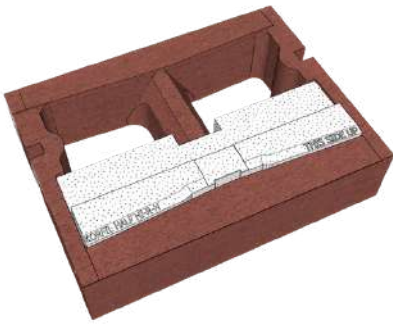


HI-R-H/HI-R Specialty Units

The HI-R-H Jamb/Corner units are the best option to assure the highest overall thermal performance for the wall assembly. These units are produced regionally; please check with your local manufacturer to assure they are available for your project location.



| 12x8x16 HI-R-H Jamb/Corner Unit | | | | | |
|---------------------------------|---------------|-------|-------|-------|-------|
| 4 inch insulation insert | Density (pcf) | | | | |
| | 95 | 105 | 115 | 125 | 135 |
| R _t Value | 13.13 | 11.87 | 10.61 | 9.45 | 8.34 |
| U Factor | 0.076 | 0.084 | 0.094 | 0.106 | 0.120 |
| Heat Capacity | 6.77 | 7.49 | 8.20 | 8.91 | 9.63 |
| Equivalent Thickness | 4.38 | 4.38 | 4.38 | 4.38 | 4.38 |



| 12x4x16 HI-R-H HALF HIGH/SPEC-BRIK HI-R-H Jamb/Corner Unit | | | | | |
|--|---------------|-------|-------|-------|-------|
| 4 inch Insulation Insert | Density (pcf) | | | | |
| | 95 | 105 | 115 | 125 | 135 |
| R _t Value | 13.82 | 12.55 | 11.25 | 10.05 | 8.90 |
| U Factor | 0.072 | 0.080 | 0.089 | 0.010 | 0.112 |
| Heat Capacity | 12.33 | 13.63 | 14.93 | 16.23 | 17.53 |
| Equivalent Thickness | 8.38 | 8.38 | 8.38 | 8.38 | 8.38 |



Additional Resources



Service and Support

The Concrete Products Group LLC (CPG) consists of regional market leaders in the concrete products industry. CPG provides industry leading support and service throughout the nation. CPG is organized to provide consistent, top-quality products to regional and national customers.



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