REAL BRICK DELIVERS REAL-LIFE ENERGY SAVINGS

Clay brick isn't just a great choice for aesthetics and lasting value. It's also one of the best choices for energy efficiency, capable of outperforming other lightweight wall systems — and not just in R-value, but in real-life performance.

PROVEN BY RESEARCH: A BRICK WALL SYSTEM CAN SAVE UP TO 50% IN ENERGY COSTS.*

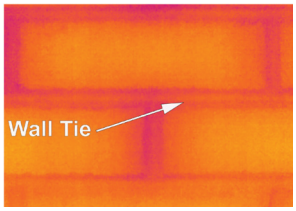
Compared to exterior insulation and finish systems (EIFS) and lightweight, low R-value claddings, brick veneer assemblies deliver measurably superior energy performance.

The combination of brick and continuous insulation is capable of more superior thermal performance than competitive, similarly backed wall systems, as measured to in simulated real-world environmental conditions that reflect dynamic thermal performance, not just static R-value.

In "hotbox" research performed by the National Brick Research Center, the brick wall system outperformed the others with energy savings of up to 50%.**

WALL ASSEMBLY		STEADY-STATE TESTING	DYNAMIC TESTING (HVAC Demand/Load)
COLD-FORMED STEEL STUD WALL SYSTEM (with batt insulation)	**BRICK + XPS c.i.**	**BEST PERFORMANCE**	**BEST PERFORMANCE**
	EIFS	10% lower	42% higher
	Lightweight Cladding[1] + XPS c.i.[2]	4% lower	38% higher
COLD-FORMED STEEL STUD WALL SYSTEM (no batt insulation)	**BRICK + XPS c.i.**	**BEST PERFORMANCE**	**BEST PERFORMANCE**
	EIFS	26% lower	50% higher
	Lightweight Cladding[1] + XPS c.i.[2]	8% lower	38% higher
CMU WALL SYSTEM	**BRICK + XPS c.i.**	**BEST PERFORMANCE**	**BEST PERFORMANCE**
	EIFS	24% lower	46% higher
	Lightweight Cladding[1] + XPS c.i.[2]	7% lower	41% higher

[1] *Lightweight cladding with a low R-value, such as fiber cement or uninsulated metal panel*
[2] *Extruded polystyrene foam insulation (continuous insulation)*



Veneer ties are not visible in infrared (IR) photos taken during hotbox testing, illustrating that ties are not thermal bridges.

FACT CHECK: TIES AND THERMAL TRANSFER

Veneer ties that anchor brick walls have been suspected of being thermal bridges, undermining some of the thermal benefits of brick. But IR images obtained during hotbox testing showed that they do not act as significant thermal bridges. Instead, the brick acts as a buffer due to its thermal mass and virtually eliminates thermal bridging through the ties.

Similarly, the research shows that weeps do not undermine the insulating benefit of the air cavity behind the brick veneer.†

Note that with any wall system, steel-stud framing is a potential source of thermal bridging, but this can be addressed with a recommended layer of continuous insulation.

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THE PROBLEM WITH R-VALUE

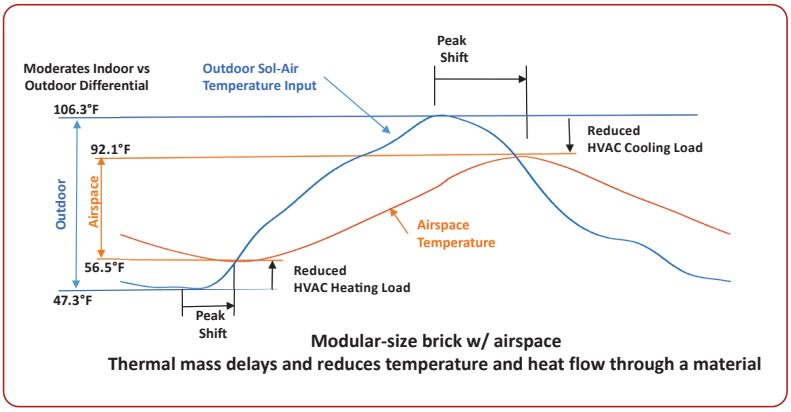
R-value is a convenient metric for comparing materials, but it's just a snapshot based on static laboratory conditions. But there is nothing static about the outside temperature. The dynamic testing by the National Brick Research Center more accurately represents real-life conditions with temperatures that fluctuate throughout the day and night.

THE HIDDEN SAVINGS IN EVERY BRICK

Brick's thermal mass gives it advantages that can't be matched by other cladding systems. Most notably, brick significantly delays the transfer of heat indoors, shifting demand for cooling to off-peak times (when energy rates are typically lower) and reducing the load on HVAC systems, generating significant savings.

When comparing wall systems using actual weather data from real-world cities over a year, climate model research shows that brick delivers superior energy performance – up to 25% better than other cladding systems – across diverse geography, from hot, dry Texas to mile-high Denver to windy Chicago.

Thermal mass reduces the indoor temperature swing and shifts the impact of temperature extremes to off-peak hours.

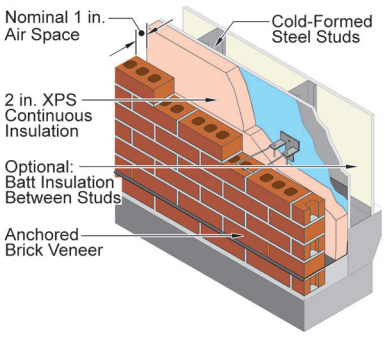


Modular-size brick w/ airspace

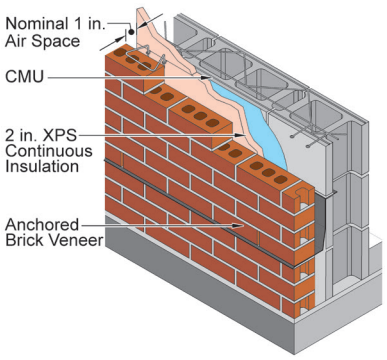
Thermal mass delays and reduces temperature and heat flow through a material

BUILDING FOR MAXIMUM ENERGY EFFICIENCY WITH BRICK

The thermal mass of brick and the airspace in brick wall systems combine to deliver superior energy performance.



Anchored Brick Veneer on Cold-Formed Steel Studs



Anchored Brick Veneer on CMU

For the specimens that included continuous insulation, the thickness of insulation was held constant at 2 inches for all wall assemblies. While there was a slight difference in performance between assemblies with EIFS compared to those with XPS, in all cases, the assemblies with brick veneer and the air space outperformed by at least 38%. Using a radiant barrier or a reflective coating with an emissivity of 0.05 adjacent to a nominal 1-inch airspace can provide performance equivalent to adding continuous insulation with an R-value of 2.6 to a wall. And the best-performing system of all is brick veneer with continuous insulation over concrete masonry, exceeding the performance of brick veneer over cold-formed steel studs by 24% to 41%, depending on the presence of batt insulation in the stud cavity.

For more information, please visit gobrick.com/commercialenergy

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* Based on dynamic thermal hotbox testing using a 24-hour sol-air cycle conducted at National Brick Research Center presented in December 2019.

** Ibid.

† Nathaniel Huygen, John Sanders. "Air flow within a brick veneer cavity wall." Proceedings of the 13th North American Masonry Conference (June 2019).