

# Thermique™ Heated Glass in Luxury Homes

*Complete Comfort, Zero Condensation*

Windows fill a home with light and beauty. Unfortunately, they also generate unpleasant chills and drafts. Plus, they can fog up in high humidity or frost over in the cold. And what's the point of a window if you can't see through it?

Thermique™ heated glass solves all of these problems.

Windows with Thermique heated glass serve as transparent radiators to provide warmth, comfort, and complete condensation control in any indoor environment. Architects are free to design with as much window space as they can imagine without any of the drawbacks associated with cold glass.

How does Thermique heated glass work? The glass itself is electrically heated with precise control. A patented Thermique controller allows for an adjustable temperature up to 105° F (40.6° C), which is warm but not hot to the touch.

If glass temperature is higher than indoor air temperature, moisture will remain in the air and not on the glass. Thermique heated glass makes it simple to keep windows warmer than the air. Your condensation problems are solved. Plus, heated windows contribute warmth to a home rather than stealing it. There are no more chills or drafts from the cold glass. This will reduce dependence on the HVAC system and may lower the overall energy bill!

## Durango, Colorado

*A Luxury Ranch*

In the mountains of Colorado, temperatures remain well below freezing for days or weeks on end.

Home builders know that windows create serious condensation problems in these conditions, especially in high humidity areas of the home such as bathrooms and indoor pools.

Gary Truax served as construction manager for the remodeling of a luxury ranch in the Durango area. The homeowner challenged him to find a solution to the steamed-up windows surrounding his indoor pool.

"Those rooms are famous for getting riddled with condensation," said Truax. "Right off the bat, I thought Thermique heated glass would be a perfect fit."

The architect's design called for one wall of the indoor pool room to consist almost entirely of glass, with four floor-to-ceiling windows overlooking the mountains. A fifth floor-to-ceiling window is located on an adjacent wall. Thermique is able to manufacture UL® approved heated glass in sizes up to 72" by 84" (42 ft.<sup>2</sup>) so there was no need to alter the architect's vision in order to incorporate Thermique heated glass.

*Thermique heated glass eliminates chills, drafts, fog, and frost.*



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— Gary Truax  
Construction Manager

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said the homeowner.*



After hearing about the benefits of warm windows in the pool room, the homeowner requested that they be installed in the master bath as well. This room features a large exterior-facing window inside a steam shower area where condensation was certain to be a problem without Thermique heated glass.

### *Clear Success*

The homeowner reports that he and his wife use the steam shower daily and the indoor pool twice a week. When the Thermique heated glass is turned on, condensation is never a problem. However, if the pool remains uncovered while the windows are turned off, a thick layer of moisture will cover the glass in the pool room. When this occurs, the homeowner simply turns on the heated glass to clear the windows of condensation before covering the pool again.

In the bathroom, the steam shower is separated from the rest of the room by an unheated glass partition. The homeowner and his wife must regularly squeegee the glass to ensure it does not streak or develop mildew and other mold problems. The heated windows do not require any maintenance to remain clear and dry.

"My wife is able to take showers and see outside to the mountains and enjoy the warmth," said the homeowner. "The window has been completely clear. There hasn't been a drop of water on it."

### *Simple Installation*

Unlike standard windows, Thermique heated glass requires a licensed electrical contractor for installation. However, Truax reports that the installation procedures remain simple and straightforward. "When you have a product like this, it's almost like a day off because it's self-explanatory," he said.

"The information is easy to understand because it's very basic," he continued. "That made it easy. No new skills are required to complete installation. Everything went smoothly from start to finish."

Once the heated windows were in place, construction crews were happy to enjoy them. The pool room became a popular place for lunches and breaks because of the warmth radiating from the glass.

"Everyone appreciated the magic of it," said Truax.

### *Additional Benefits*

The architect designed the indoor pool room with windows that reach the floor so swimmers can see outside while they are in the water. "That was a top priority for the homeowner, that you would always be able to see the view," recalled Truax.

But condensation control is not the only benefit. Swimmers coming out of the pool feel no chill from the windows. Because of the radiant heat, they are able to dry off in complete comfort.

"I'm still caught by surprise to pass by the windows and feel the warmth. I've been trained by experience to expect to feel cold by a window," said Truax.

Energy efficiency is another benefit. Thermique heated glass is designed to radiate warmth in one direction only, towards the home's interior, so heat energy is not wasted. The exterior pane of a heated window unit is not appreciably warmer than a standard window pane, even when the interior pane is at full heat. This fact often surprises people who have never witnessed Thermique heated glass in action.

"What impressed me was that the cold side stays cold," said the homeowner.

Meanwhile, the warm side of the glass has proven its effectiveness in extreme winter conditions outside the home. Durango recently experienced temperatures as low as -20° F (-29° C), and the heated windows maintained their temperature and comfort. In fact, the radiant heating is so effective that the homeowner has never even used the highest setting.

Adding to the energy efficiency of the windows is the reduced reliance on traditional heating. "Between the heated pool and the warm glass, there's no need for any other source of heat in the room," said the homeowner.

Since the home's HVAC system does not have to heat this room (which is both large enough for an indoor pool and has considerable window space), the homeowner is able to significantly reduce the energy that would be used for traditional heating. In many home designs, reductions in energy use by the HVAC system will exceed the power required to heat the windows, resulting in an overall reduction in utility bills.

### *Another Satisfied Customer*

Both builder and homeowner report complete satisfaction with Thermique heated glass. "It's great to work on a project where the glass has not done anything but perform as promised," said Truax. "It takes the whole call-back consideration away from us."

"Yes, I'm very pleased. The windows perform as well or better than I expected," said the homeowner. "No problems, none whatsoever—and I'd be the first to complain if something wasn't working."

"He's a person that pays attention to detail, and he'd let us know," agreed Truax with a smile.

## **Lake Geneva**

### *An Inspired Home*

Inspired by a Frank Lloyd Wright home in Palo Alto, California, architect Ken Dahlin designed a 6,500 sq. ft. home on 2.5 acres of wooded property in Lake Geneva, Wisconsin. The home follows Wright's principles of "organic architecture" to unite interior and exterior, so each room is in harmony with its natural surroundings.

Windows are a critical element of architectural design in order to bring the outdoor environment inside the home. Dahlin wanted to maximize window space, but he was acutely aware of the design problems created by ordinary window glass.

"It causes a lot of technical problems with cold and condensation," said Dahlin, who serves as owner and CEO of Genesis Architecture in Racine, Wisconsin. "How do you design a master bath with a lot of glass,



which I always like to do, without creating problems with human comfort and condensation?"

In this case, the homeowner suggested a new technology designed to solve the architect's dilemma. Thermique heated glass transforms home windows into a source of radiant heat. The glass itself serves as a perfectly transparent heating element.

Dahlin investigated Thermique technology and discovered it was a good design fit for the Lake Geneva home. "The integration of Thermique heated glass was seamless," said Dahlin. "There was nothing we had to change or adjust, including the framing materials for the windows."

### *No Condensation*

The master bathroom, like the rest of the home, was designed on a 60° hexagonal grid. The bathtub is surrounded by three large windows. Ordinary windows would quickly fog up in this situation, but not Thermique heated glass.

"It's nice to be able to lay back in the bath and experience the outdoors," said the homeowner.



"On cold days, my heated glass keeps the window clean and clear. Fog never forms on the inside, and frost never forms on the outside."

According to the homeowner, his heated windows have functioned "flawlessly" since they were installed. The temperature of the glass is easily adjusted with a wall-mounted controller that resembles a dimming switch for lighting.

The homeowner knows his heated windows are effective because there has been a time or two when he has slipped into a warm bath without turning them on. The windows immediately fogged up, ruining his view. At that point, he steps out of the bath and turns the switch on the wall. "The windows defog very quickly," he confirmed.

*"I can pick out four of five other places where I wish they were installed," said the homeowner.*

Eliminating condensation has advantages beyond visibility. Moisture that forms on the glass can warp or rot a wooden window frame, like the ones used in the Lake Geneva home. That same moisture also contributes to problems with mold and bacteria. Thermique heated glass helps prevent these problems as well.

### *Enhanced Comfort*

In addition to providing condensation control, Thermique heated glass also enhances indoor comfort by supplementing a building's heating system. The bathroom at the Lake Geneva home is heated by radiant flooring. If the windows surrounding the bathtub were not also heated, they would be stealing heat energy from the room—creating a chill and forcing the floor heating to work harder to compensate.

"When you're trying to bring the outdoors inside, you're going to be fighting to maintain warmth and comfort in the colder months," said Earl Lieske, who served as project architect during construction of the Lake Geneva home. "Glass is a serious issue for our Midwest winters. It is almost always a heat drain."

With windows surrounding the tub, the Lake Geneva homeowner would be subject to the effects of the cold glass the moment he stepped out of the bath. Thermique heated glass eliminates the problem.

"Heated windows sounded like a great idea," recalled Lieske. "They become a positive rather than a negative in the thermal envelope. That means you could have a very big tub space and still remain cozy."

### *Complete Satisfaction*

The homeowner reports complete satisfaction with his heated windows. "We've had a particularly nasty winter, with temperatures between -5 and -10 degrees," he said. "The heated windows have performed exactly as promised under brutal conditions. In fact, I can pick out four of five other places where I wish they were installed. I didn't do the kitchen. Now I wish I had."

The architects are also proud of the results. "I would definitely use heated glass again," said Dahlin. "We have many applications for this product that I can see. It's a good design fit for a clean, contemporary style home like this one. Heated glass just needs more exposure because it seems like a great product."

"Even with double-glazed windows, you often have to limit the amount of glass you can use in the bathroom because of the potentially high humidity," said Lieske. "A product like this allows you to be more creative. In my mind, that's where it shines. I really hope we can use more heated glass in the work we do."

## **About Thermique Technologies**

Combining more than 60 years of experience with cutting-edge expertise, Thermique Technologies, LLC, is today's premier developer of heated glass technology. Thermique heated glass is utilized in heated windows, glass towel warmers, and heated food service cabinets. Headquartered in Chicago, Ill., Thermique Technologies is a wholly owned subsidiary of Engineered Glass Products (EGP).

**thermique™**

2857 S. Halsted Street  
Chicago, IL 60608

info@thermiquetech.com  
thermiquetech.com