

Energy-thrifty building keeps cool without air conditioning

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BY DAVID ROEDER BUSINESS REPORTER

On Friday, the hottest day of the year, 150 employees of the giftware seller Roman Inc. toiled in an Addison warehouse without air conditioning.

It was just another day—absolutely comfortable. They drove their forklifts and packed their boxes in a hangarlike oasis.

Most of the warehouse at 880 S. Rohlwing Road doesn't even have air conditioning, nor does it use heat in the winter. Yet, its builder said the structure will maintain a year-round temperature range about 7 degrees either side of the optimal 72 degrees.

Battling Friday's extreme weather, the building wasn't able to keep to that standard. Sensors hooked up to a computer monitor showed the warehouse's temperature at about 82 degrees. Outside on the roof, the reading was 104 degrees and headed higher.

"It's about as warm in this building as we've ever seen it," said Peter Konopka, owner of Solarcrete, which built the warehouse. He was taken aback by the conditions inside, but he needn't have been.

Although the heat wave transformed Chicago into the tropics, this workplace was more like a pleasant summer evening. A ventilation system kept the air dry and moving, so there was no humidity, no mustiness.

And it's done without what we consider modern technology: 10-ton cooling units humming on the roof. Konopka said the building works because of Solarcrete's patented construction process, using concrete and Styrofoam in the exterior walls, and that he can do it for most industrial, commercial and even residential users.

What's the energy savings? He said 75 percent in most cases.

Roman's vice president of administration, Tony Jedlinski, said most manufacturers budget utility costs at about 50 cents a square foot. "We come in at a nickel a foot," he said.

The building is like an enormous ice chest. Its walls, foundation and roof all have insulation with a value of R-35, compared with R-8 to R-12 found in most buildings. The walls have no joints, through which air can escape, and the structure is insulated beneath the Earth's frost line.

Each exterior wall is a foot thick, layers of Styrofoam sandwiched between concrete. "We use a very dense concrete," Konopka said. "It has no rock and twice as much cement."

Each entrance is a double-doored airlock, even the loading docks.

Windows, by the way, are allowed. The Roman building uses glass to relieve the boxlike effect of the warehouse.

Jedlinski loves the place, all 525,000 square feet. Without the heating and cooling equipment, maintenance bills are lower, he said. "All I have to remember to do is keep the doors closed."

Why, then, aren't there more buildings like it? "You tell people about the benefits and sometimes they don't believe you," Jedlinski said.

Konopka, 52, is an electrical engineer, not a marketer, and his company is still working in relative obscurity despite having finished more than 150 buildings in the Chicago area and hundreds more across the country.

One was a smaller building in Roselle that Solarcrete completed for Roman in 1986. Jedlinski said that by 2003, the building's energy savings will pay its entire \$2.5 million cost.

Experts said cement construction hasn't caught on for several reasons, some having to do with conservatism and stubbornness in the building industry.

"Builders don't care about the savings on energy since they're not occupying the buildings and they don't know about the consumer demand," said Thomas Hanley, whose construction firm, Energy Block Inc., also uses concrete but a different construction method.

Moreover, few contractors are familiar with concrete construction and some are afraid of it, since it renders millions of dollars in equipment obsolete. The process also can provoke opposition from trade unions; Hanley's tried to get around that by setting up a new union for concrete construction.

Solarcrete, with its main operations in far northwest suburban Union, has been around since 1973. Konopka said it was founded by a civil engineer and a mason contractor, whose idea foundered when they franchised the operation. They didn't provide the training and some projects turned into costly messes, he said.

After working as a franchisee, Konopka bought the company with an Ohio-based partner, Don Oberlin, in 1994 and set out to get it on track. Most of its business is with family-owned companies such as Roman "that still know the value of a dollar," he said.

Konopka said finding qualified labor is still a problem, especially if he's to build more homes. "We're looking for contractors to teach our techniques to," he said.

The company has built several homes in McHenry County and one for an affordable housing program in Chicago. "Our house is not as cheap as wood-frame construction, but it's close to masonry," he said.

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