CAHI™ CONNECTICUT ASSOCIATION OF HOME INSPECTORS, INC.

MONTHLY

News and Views from the Connecticut Association of Home Inspectors, Inc. June 2008

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Meeting Dates

Jun 25 ***Geothermal Heating & Cooling Systems*** **- Nat Gifford from EarthMint**

Jul 23 ***On Location in Seymour*** **- Larry Janesky, Basement Systems, Inc.**

August ***Vacation Month*** **No Meeting Scheduled**

Holiday Inn
201 Washington Ave
North Haven
(203) 239-6700

Geothermal Heat Pumps

Heat pumps move heat from one place to another - from outside to inside a home, for example. That's why they're called "heat pumps."

We explained the way that they work in the section "Central HVAC." Here's a simplified version of how a heat pump works:

All heat pumps have an outdoor unit (called a condenser) and an indoor unit (an evaporator coil).

A substance called a *refrigerant* carries the heat from one area to another. When compressed, it is a high temperature, high-pressure liquid. If it is allowed to expand, it turns into a low temperature, low pressure gas. The gas then absorbs heat.

In the winter the normal heat pump system extracts heat from outdoor air and transfers it inside where it is circulated through your home's ductwork by a fan.

Even cold air contains a great deal of heat; the temperature at which air no longer carries any heat is well below -200 degrees Fahrenheit. But the coldest temperature ever recorded in the lower 48 states was -70 degrees, recorded at Roger Pass, Montana on January 20, 1954. Obviously in such weather, a heat pump would have to work pretty hard to produce 68-degree temperatures inside your home.

That's why geothermal heat pumps are so efficient.

Geothermal heat pumps are similar to ordinary heat pumps, but instead of using heat found in outside air, they rely on the stable, even heat of the earth to provide heating, air conditioning and, in most cases, hot water.

From Montana's -70 degree temperature, to the highest temperature ever recorded in the U.S. - 134 degrees in Death Valley, California, in 1913 - many parts of the country experience seasonal temperature extremes. A few feet below the earth's surface, however, the ground remains at a relatively constant temperature. Although the temperatures vary according to latitude, at six feet underground, temperatures range from 45 degrees to 75 degrees Fahrenheit.

Ever been inside a cave in the summer? The air underground is a constant, cooler temperature than the air outside. During the winter, that same constant cave temperature is warmer than the air outside.

That's the principle behind geothermal heat pumps. In the winter, they move the heat from the earth into your house. In the summer, they pull the heat

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President's Corner

Bernie Caliendo

As I mentioned in previous columns, this year is the year of uncertainty. This is definitely the slowest year I can remember in the past decade. Times are really tough and the cost of doing business has really crippled our profession. The rape of America by the oil speculators will affect all of us. Transportation, food, health care and the cost of heating our homes this coming year will definitely curtail any discretionary spending we all once enjoyed. The state is up to its normal tax and spend, without regard for a looming hundreds-of-millions-of-dollars deficit which we will all have to pay for in the future. Since the income tax took effect 18 years ago, the state budget has grown from 7 billion dollars to over 18 billion and still growing. I'll be a monkey's uncle if we don't hear they have to increase the income tax rate next session. The new Speaker of the House will be the biggest liberal socialist we have ever seen. Come Election Day in November, whether you are a Democrat or Republican, throw them all out!

On a much more positive note, we have a great presentation this month on Geothermal systems. This is a first for CAHI to present this subject and it will only become a more popular form of heating and cooling in the future here in Connecticut. The cost is relatively expensive now, but the benefits and savings in the long run are phenomenal. Don't miss this one! Also don't forget to sign up on our web site for the July 23rd meeting at Basement Systems in Seymour from 6:00 to 9:30 pm. More information is included in this newsletter.

In other news, we addressed concerns and sent the Commissioner of the Department of Consumer Protection (DCP) and the Licensing Board a letter for their May 1st meeting. The subject matter deals with the imposition of allowing PSI (the exam testing vendor) to require all Continuing Education (CE) providers to report to PSI, on an individual basis, all approved CE credits as obtained within 10 days of the event. This requires an 8 ½ X 11 form to be filled out with name, codes, license numbers, school code, dates, subject and other individual information. It is to be electronically submitted to PSI with a $.50 submission fee paid by the organization or school's credit card. Our letter stated that we do not have paid personnel to provide this to PSI as it would require approximately 10 minutes for each submission. In April, CAHI handed out 151 CE certificates to members - 151 X 10 minutes ÷ 60 = 25.1 hours of processing time at an association cost of $75.50, let alone CAHI does not have a corporate credit card. Do we have anyone who is willing to spend 3.14 days processing these forms and using your own credit card (which CAHI would reimburse you) to meet this requirement without compensation?

We have offered to provide a more efficient way to supply the department with accurate monthly, yearly or full 2-year cycle data on every individual we provide CE's to at no cost to anyone. Both ASHI chapters have signed on to this issue and we await a response from the DCP and the Board.

We'll let you know.

Bernie

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from your home and discharge it into the ground.

Studies show that approximately 70 percent of the energy used in a geothermal heat pump system is renewable energy from the ground. The earth's constant temperature is what makes geothermal heat pumps one of the most efficient, comfortable, and quiet heating and cooling technologies available today. While they may be more costly to install initially than regular heat pumps, they can produce markedly lower energy bills - 30 percent to 40 percent lower, according to estimates from the U.S. Environmental Protection Agency, who now includes geothermal heat pumps in the types of products rated in the EnergyStar® program. Because they are mechanically simple and outside parts of the system are below ground and protected from the weather, maintenance costs are often lower as well.

As an added benefit, systems can be equipped with a device called a "desuperheater" can heat household water, which circulates into the regular water heater tank. In the summer, heat that is taken from the house and would be expelled into the loop is used to heat the water for free. In the winter, the desuperheater can reduce water-heating costs by about half, while a conventional water heater meets the rest of the household's needs. In the spring and fall when temperatures are mild and the heat pump may not be operating at all, the regular water heater provides hot water.

How Do They Compare?

Surveys taken by utilities have found that homeowners using geothermal heat pumps rate them highly when compared to conventional systems. Figures indicate that more than 95 percent of all geothermal heat pump owners would recommend a similar system to their friends and family.

Cost

As a rule of thumb, a geothermal heat pump system costs about $2,500 per ton of capacity. The typically sized home would use a three-ton unit costing roughly $7,500. That initial cost is nearly twice the price of a regular heat pump system that would probably cost about $4,000, with air conditioning.

When energy costs are figured in, however, geothermal systems are probably cheaper. If the extra price for the geothermal system is included in an energy efficiency mortgage, the homeowner could have a positive cash flow from the beginning. The extra $3,500 cost of the more efficient system may add $30 per month to each mortgage payment - an amount more than offset by the savings on the homeowner's utility bill.

Added to an already built home, an efficient geothermal system saves enough on utility bills that the investment can be recouped in two to ten years.

Durability

Geothermal heat pumps are durable and require little maintenance. They have fewer mechanical components than other systems, and most of those components are underground, sheltered from the weather. The underground piping used in the system is often guaranteed to last 25 to 50 years and is virtually worry-free. The components inside the house are small and easily accessible for maintenance. Warm and cool air is distributed through ductwork, just as in a regular forced-air system.

Since geothermal systems have no outside condensing units like air conditioners, they are quieter to operate.

How Do They Work?

Remember, a geothermal heat pump doesn't create heat by burning fuel, like a furnace does. Instead, in

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winter it collects the Earth's natural heat through a series of pipes, called a loop, installed below the surface of the ground or submersed in a pond or lake. Fluid circulates through the loop and carries the heat to the house. There, an electrically driven compressor and a heat exchanger concentrate the Earth's energy and release it inside the home at a higher temperature. Ductwork distributes the heat to different rooms.

In summer, the process is reversed. The underground loop draws excess heat from the house and allows it to be absorbed by the Earth. The system cools your home in the same way that a refrigerator keeps your food cool - by drawing heat from the interior, not by blowing in cold air.

The geothermal loop that is buried underground is typically made of high-density polyethylene, a tough plastic that is extraordinarily durable but which allows heat to pass through efficiently. When installers connect sections of pipe, they heat fuse the joints, making the connections stronger than the pipe itself. The fluid in the loop is water or an environmentally safe antifreeze solution that circulates through the pipes in a closed system.

Another type of geothermal system uses a loop of copper piping placed underground. When refrigerant is pumped through the loop, heat is transferred directly through the copper to the earth.

Types of Loops

Geothermal heat pump systems are usually not do-it-yourself projects. To ensure good results, the piping should be installed by professionals who follow procedures established by the International Ground Source Heat Pump Association (IGSHPA). Designing the system also calls for professional expertise: the length of the loop depends upon a number of factors, including the type of loop configuration used; your home's heating and air conditioning load; local soil conditions and landscaping; and the severity of your climate. Larger homes requiring more heating or air conditioning generally need larger loops than smaller homes. Homes in climates where temperatures are extreme also generally require larger loops.

Here are the typical loop configurations:

Horizontal Ground Closed Loops

This type is usually the most cost effective when trenches are easy to dig and the size of the yard is adequate. Workers use trenchers or backhoes to dig the trenches three to six feet below the ground in which they lay a series of parallel plastic pipes. They backfill the trench, taking care not to allow sharp rocks or debris to damage the pipes. Fluid runs through the pipe in a closed system. A typical horizontal loop will be 400 to 600 feet long for each ton of heating and cooling.

Vertical Ground Closed Loops

This type of loop is used where there is little yard space, when surface rocks make digging impractical, or when you want to disrupt the landscape as little as possible. Vertical holes 150 to 450 feet deep - much like wells - are bored in the ground, and a single loop of pipe with a U-bend at the bottom is inserted before the hole is backfilled. Each vertical pipe is then connected to a horizontal underground pipe that carries fluid in a closed system to and from the indoor exchange unit. Vertical loops are generally more expensive to install, but require less piping than horizontal loops because the Earth's temperature is more stable farther below the surface.

Pond Closed Loops

This type of loop design may be the most economical when a home is near a body of water such as a shallow pond or lake. Fluid circulates underwater through polyethylene piping in a closed system, just as it does through ground loops. The pipes may be coiled in a slinky shape to fit more of it into a given amount of space. Since it is a closed system, it results in no adverse impacts on the aquatic system.

Although they are less applicable to California, there are other loop systems described at the Geothermal Heat Pump Consortium's Web Site - www.geoexchange.org. These include an Open Loop System in which ground water is pumped into and out of a building, transferring its heat in the process; and Standing Column Well Systems, which can be up to 1,500 feet deep and can also

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furnish potable water.

In a few places, developers have installed large community loops, which are shared by all of the homes in a housing project.

To date, geothermal heat pumps are an under-used technology, merely because few people are aware of its potential. The Department of Energy's Office of Geothermal Technologies, however, wants to increase installations of geothermal systems to about 400,000 a year by 2005. If the goal is reached, that would mean that 2 million systems would be in service, saving consumers over $400 million per year in energy bills and reducing U.S. greenhouse gas emissions by over 1 million metric tons of carbon each year.

CAHI's July 23rd Monthly Meeting ON LOCATION in Seymour

3 CE's & It's free!

Larry Janesky, President of Basement Systems, Inc., 60 Silvermine Road in Seymour, CT has most generously offered CAHI a free buffet dinner at 6:00 p.m. and a 3-hour presentation with a plant tour ending at 9:30 p.m. at their location.

This meeting will take the place of our Holiday Inn location for July.

You must sign up on our web site under "Special Events" and click on "Sign-up for July 23rd monthly meeting at Basement Systems in Seymour". This dinner and presentation is open only to CAHI members in good standing.

Due to dinner preparations and individual attendance certificates being printed in advance, **no walk-ins** will be allowed.

Please arrive by 6 pm. Certificates will be distributed at 9:30 pm.

See you there!

Counterfeit Circuit Breakers Recalled By Specialty Lamp International Due to Fire Hazard

May 27, 2008
Release #08-286

WASHINGTON, D.C. - The U.S. Consumer Product Safety Commission, in cooperation with the firm named below, today announced a voluntary recall of the following consumer product. Consumers should stop using recalled products immediately unless otherwise instructed.

Name of Product: Counterfeit Circuit Breakers labeled as "Square D"

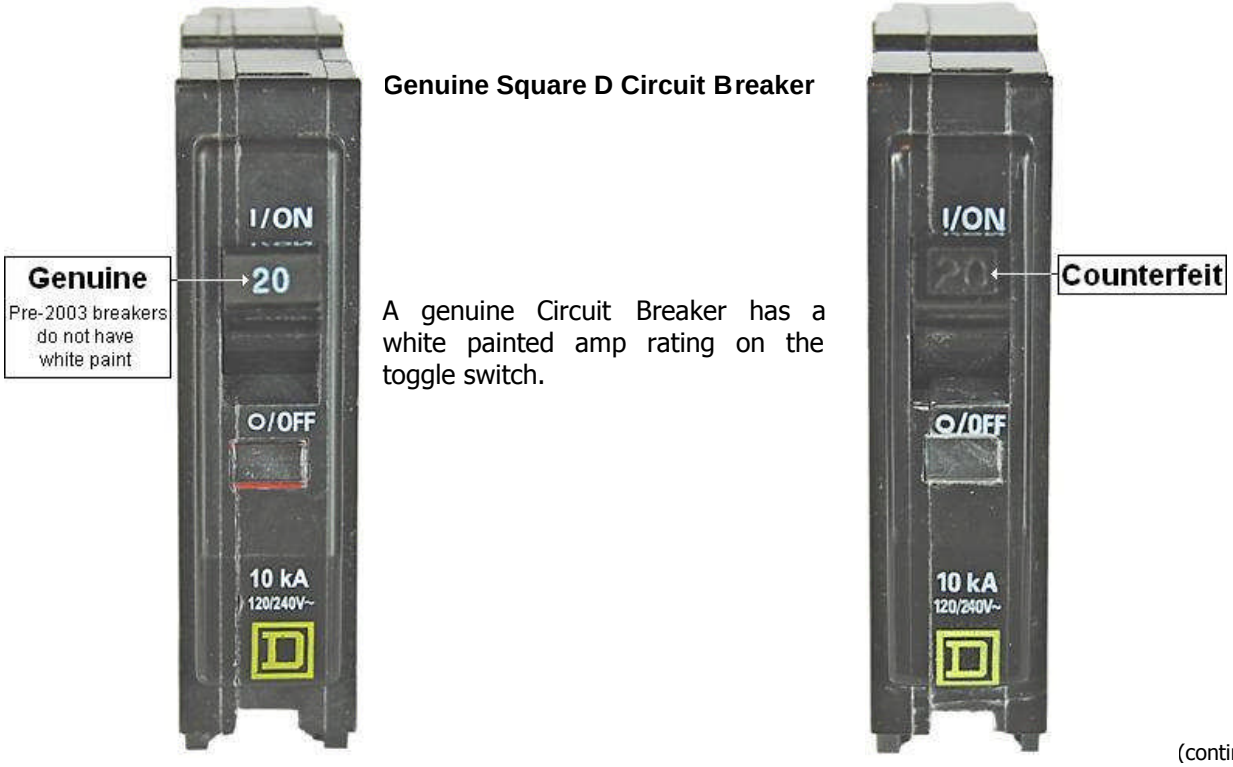
Units: About 371,000

Distributor: Specialty Lamp International Inc., of Deerfield Beach, Fla.

Hazard: The recalled circuit breakers labeled "Square D" have been determined by Square D to be counterfeit and can fail to trip when they are overloaded, posing a fire hazard to consumers.

Incidents/Injuries: None reported.

Description: The counterfeit circuit breakers are black and are labeled as Square D QO-series models 115, 120, 130, 215, 220, 230, 240, 250, 260 and 2020 and Square D QOB-series models 115, 120, 130, 220, 230, 250, 260 and 1515. Actual Square D circuit breakers have (a) the amp rating written on the handle in white paint on the front of the breaker (authentic Square D circuit breakers manufactured prior to 2003 did not have white paint on the amperage numbers); (b) the Square D insignia molded onto the breaker side, and; (c) a yellow chromate mounting clip with half of the top of the clip visible. If your breaker, labeled as Square D, does not match this description, it could be counterfeit.



Genuine Square D Circuit Breaker

A genuine Circuit Breaker has a white painted amp rating on the toggle switch.

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Sold by: Electrical product distributors nationwide from May 2005 through June 2006 for between $3 and $23.

Manufactured in: China or Unknown

Remedy: Consumers should contact Specialty to determine if the breaker they have is counterfeit and to arrange for a free inspection and replacement or refund if necessary.

Consumer Contact: For additional information, contact Specialty at (866) 650-3076 between 8 a.m. and 5 p.m. ET, by email bart@specialty-lamp.com, or visit the company's Web site at www.ebulb.net. This is not a Square D Company recall.

The U.S. Consumer Product Safety Commission is charged with protecting the public from unreasonable risks of serious injury or death from more than 15,000 types of consumer products under the agency's jurisdiction. Deaths, injuries and property damage from consumer product incidents cost the nation more than $800 billion annually. The CPSC is committed to protecting consumers and families from products that pose a fire, electrical, chemical, or mechanical hazard. The CPSC's work to ensure the safety of consumer products - such as toys, cribs, power tools, cigarette lighters, and household chemicals - contributed significantly to the decline in the rate of deaths and injuries associated with consumer products over the past 30 years.

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