Caleffi North America, Inc.
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Radiant Floor Heating with Solar Thermal

Summer 2012

Installation Location:
Midwest Renewable Energy Association (MREA)
Custer, Wisconsin

Project:
Solar thermal energy for winter radiant heating

Design:
StarMax V™ Flat Plate Solar Collectors (NAS154 Series)
Collector Racking (NAS100)

Purchaser:
Midwest Renewable Energy Association

The Midwest Renewable Energy Association (MREA) is a non-profit based in Custer, Wis. For the past 25 years, the MREA has been committed to educating homeowners, businesses and local governments concerning renewable energy and sustainable living solutions. In 2012, the organization was investigating deploying an energy efficient solution to heat their training building during the winter months. Because the building is used most often during the milder spring and summer months, the building can be kept at a much lower ambient temperature during the winter. Combining an advantageous roof pitch (60° angle) and radiant tubing built into the existing floor, solar thermal was an obvious radiant heat solution.

MREA decided to flush roof mount the system using Caleffi solar racking. Ten StarMax V™ panels would provide the necessary heating capacity. Because the fifth port on the bottom of the StarMax V accommodates the slope to ensure proper drainage, an aesthetically pleasing drainback design was utilized so that typical panel tilting could be avoided. The patented internal design of the StarMax V features two internal headers that are sloped to the center and a bottom outlet on each collector allowing all collectors to be mounted at an even height in a drainback system.

During design and installation project stages, the MREA hosted training sessions for solar thermal installers including MREA instructors and students. The students designed and installed the resulting drainback system, reinforcing MREA's educational vision. With the Caleffi drainback system deployed, the building is kept at 40°F from November to February. The system not only provides enough Btu's for heating, but also fulfills any domestic hot water needs. On a recent cold winter day at the training facility in January of 2013, a daunting -10°F outdoor air temperature was no match for the 150°F temperature generated from the StarMax V panels!

The Caleffi system is also used for hands-on training during the summer, assisting students in learning about solar thermal technologies and installation practices. The solar system is a valuable and visual demonstration that lends itself well to MREA's mission: educating members about practical, quality and cost-effective renewable and sustainable solutions as well as meeting the organization's need for a cost-effective method to heat the building during the cold winter months.

(photo's Courtesy of: Midwest Renewable Energy Association/ Amiee Wetmore)

Radiant Floor Heating with Solar Thermal

Summer 2012 (continued)

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Solar Beer in Milwaukee

Spring 2013

Project:
Milwaukee Brewing Company Solar Water Heating

Place:
Milwaukee, Wis.

Design:
StarMax™ 4-port Solar Collectors
iSolar™ BX Controller

Purchaser:
Engineer/Contractor:
H&H Solar Energy Services
Madison, Wis.

Milwaukee Brewing Company is Milwaukee's first brewer to utilize solar hot water to supplement their heavy process water demands and reduce the high cost of energy in the beer brewing process. Located in Milwaukee, WI, the facility installed a solar hot water heating system during the spring of 2013.

The system is projected to save the brewery about 27% of the cost incurred to heat water. The project was funded in part with grants from the state Focus on Energy program as well as the *ME2 Milwaukee Energy Efficiency* program and the city of Milwaukee's solar program, Milwaukee Shines. "Here's a good example of a perfect application for solar hot water," said Amy Heart, who runs the program. "Breweries use a lot of water- and so it made sense for them to invest in this." Brewery owner Jim McCabe adds "we hope our installation encourages others to make the investment. This project will help boost the brewery's competitiveness."

The 1500 gallons of process water the brewery uses every day was still being heated with natural gas. According to Adam Gusse, project manager of design/build contractor H&H Solar Energy Services based in Madison, Wis, "Milwaukee Brewing decided to free itself from the expense and environmental impact of natural gas by turning to solar water heating." While each brewer's process is slightly different, beer brewing requires very hot water for multiple processing steps. It naturally requires a great deal of thermal energy to heat such a great deal of water.

The project's design, manufacturing, and installation came almost entirely from Wisconsin companies. H&H Solar Energy Services designed and installed the system. "Because of the brewery's requirement for a top-quality system the decision to use Caleffi solar heating components was easy", says Gusse.

The system is comprised of (28) 4 x 10 feet Caleffi 4-port StarMax™ collectors for a total capacity of 1,120,000 kBTU/day, installed on the roof, a 175-gallon solar drain back tank, and two specially-made 550 gallon solar storage tanks that rest on the brewery floor. From there, storage water is pumped into a multipurpose 3000 gallon hot water tank as needed.. The system is controlled with a Caleffi iSolar™ BX multi-functional temperature differential controller, which includes built-in heat metering and data logging. The energy measurement functionality comes by connecting the controller to a 1-1/2" Caleffi V40 multi-jet rotary pulse flow meter and supply and return temperature sensors. This accurately measures how much heat is produced by the solar system, which directly translates into fuel savings. With its production of 1200-1500 gallons of hot water per day, the system immediately started making a difference in the brewery's natural gas consumption.