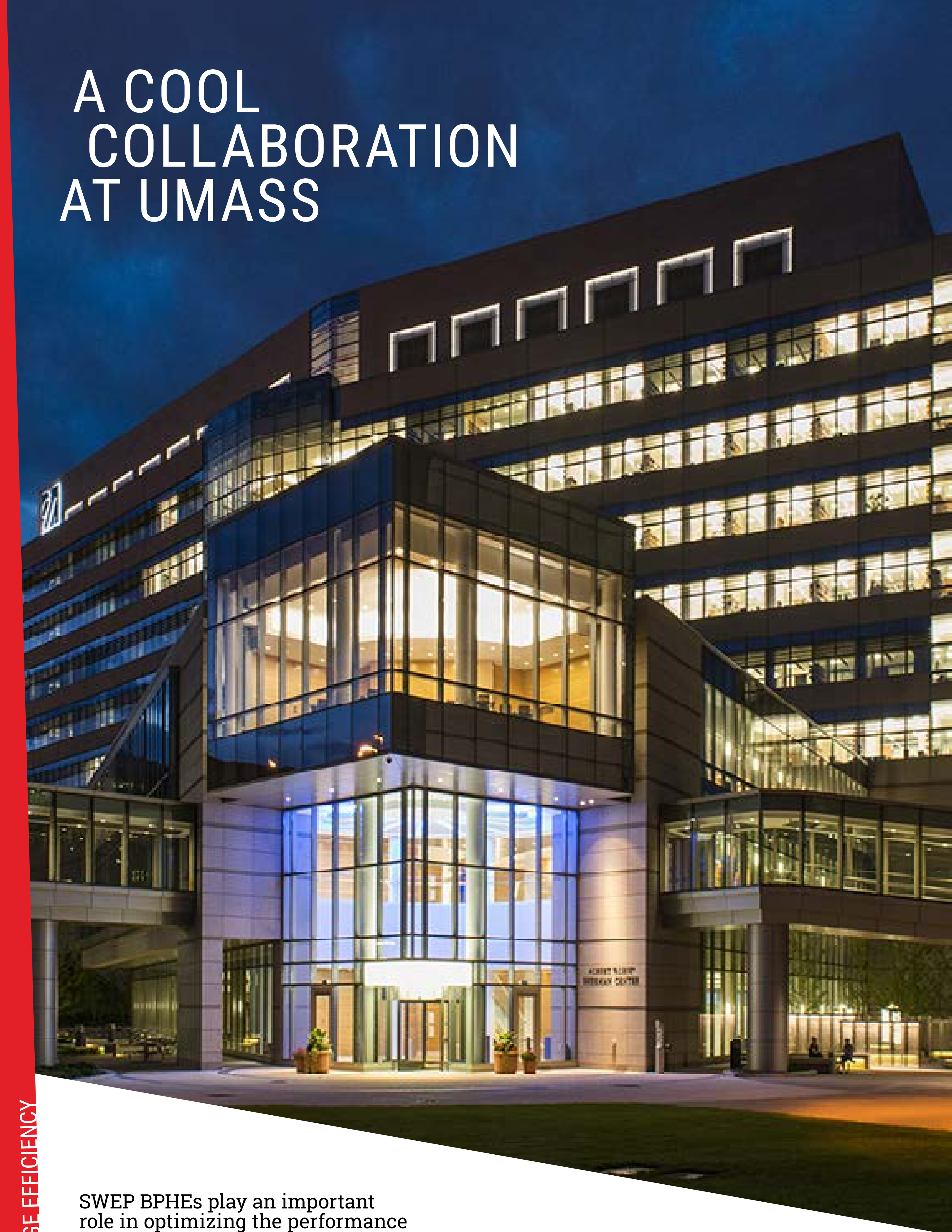
A COOL COLLABORATION AT UMASS



CHALLENGE EFFICIENCY

SWEP BPHEs play an important role in optimizing the performance of the heat recovery operation for the Albert Sherman Center on the University of Massachusettes Medical School campus.

When the University of Massachusetts Medical School unveiled its $400-million, state-of-the-art Albert Sherman Center in early 2013 on its Worcester, MA, campus, it was said that it would allow the school to "enter a new era of biomedical research, medical education and campus collaboration." Collaboration would also play a prominent role in how the 11-story, 512,000-square-foot building would be cooled during the warm and humid summers that are quite common locally.

That collaborative effort was driven by the needs of the University of Massachusetts Building Authority, which was responsible for the operation of the building's cooling system, and the ability of Konvekta AG, a St. Gallen, Switzerland-based developer and provider of high-performance energy-recovery systems, to meet those needs.

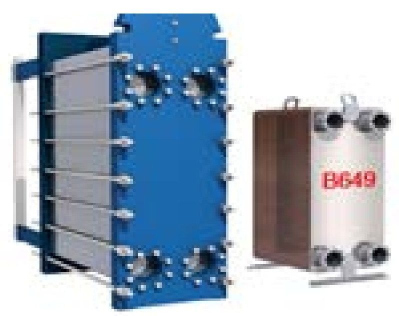
"When we opened the Sherman Center, we knew we would have to add cooling capacity and someone recommended Konvekta," recalled David MacNeil, Senior Mechanical Project Manager for the Department of Facilities Management at the UMass Medical School. "We looked at their system and we liked what we saw."

Taking the Next Step

Konvekta determined that the Sherman Center would need two dedicated air-handling units to ensure satisfactory cooling during summer extremes. Next, Konvekta decided which type of heat exchanger would efficiently recover the heat generated when the two air-handling units were operating. Konvekta chose brazed plate heat exchanger (BPHE) technology.

The design and performance of BPHEs distinguish them from competing technologies, such as gasket plate heat exchangers. BPHEs are constructed as a package of corrugated channel plates with a filler material between them. During the vacuum-brazing process, the filler material forms a brazed joint at every contact point between the plates, creating channels through which the media flow. This allows media at different temperatures to come into close proximity and enables heat or cold to be transferred from one media to the other very efficiently.

The concept is similar to other plate-and-frame heat-exchanger technologies, but without the need for gaskets and frame parts that can fail and leak, leading to potentially high cleanup, maintenance and replacement costs.



Gasket plate heat exchangers (GPHE), left, represent the older heat exchanger technology and are much larger than the compact size of the newer brazed plate heat exchanger (BPHE) technology, right.

Other advantages that BPHEs offer in cooling applications include compact size; more efficient operation; flexible installation; self-cleaning operation; lower life-cycle cost; and the ability to be customized to meet the needs of every unique installation.

Simon Buehler, Sales Manager for Konvekta, not only recommended BPHEs for the air-handling units, but BPHEs specifically from SWEP, Landskrona, Sweden, since 1983 a world-leading supplier of BPHEs to the HVAC and industrial markets.

"Our business relationship with SWEP began many years ago in Germany," said Buehler. "Today, SWEP is our main supplier of BPHEs. The excellent SWEP Software Package (SSP) calculation platform makes it very easy for our engineers to select the right BPHE for the project."

SSP is a Web-based application featuring unique software that enables the user to perform advanced heat-exchange calculations. Simply enter the expected operational parameters (fluid temperatures, pressures and desired flow rates), and SSP immediately lists the BPHE model that best meets those requirements.

For the air-handling units at the Sherman Center, Buehler and Konvekta recommended a pair of B50H BPHEs be installed. The B50H models were the best choice because SWEP has designed them to be used in demanding applications. With three different plate combinations and 2.5" (63.5 mm) connections, they are an ideal solution for high-volume applications that can require flow rates of as much as 56 m3/hr (246 gpm).

"SWEP B-type heat exchangers can optimize the use of energy, material and space in cooling systems," said Buehler. "They are compact, less costly than other solutions, durable and have high heat-transfer performance. The B50H model is also perfect for operations with low pressure drops, high flows and where the temperature difference between the two media is typically very small. At the Sherman Center, the temperature difference between the cooling-water inlet and water/glycol outlet is only 4 °F."

Conclusion

The SWEP BPHEs began operating in conjunction with the air-handling units in mid-2015 and, according to MacNeil, have sinceperformed without a hitch

"We really only need them when it's very hot out, 97 and humid. That's when we get the supplemental cooling we need from the BPHEs," said MacNeil. "They're so simple and work well; you just install them and you very rarely have any issues. They definitely meet our needs."