

## Case Study

# A Benchmark History Lesson Helps a Texas University Save Money and Energy

Customer	University of North Texas
Location	Denton, TX
Industry	Education
Sales Representative	Calloway Engineered Systems
AERCO Product Installed	Benchmark 3000, Innovation 1060



### What the Client Needed

Over the years, David Young, utilities supervisor at the University of North Texas (UNT), has learned the value of AERCO high-efficiency boilers. Since 2002, 20 of the company's Benchmark units have been installed in various buildings throughout UNT's Denton campus. In every instance, the performance and cost savings that these fully-modulating and condensing boilers provided were more than he imagined. So, when the engineering firm contracted to design the new chemistry building switched the specified AERCO boilers to cheaper copper-fin alternatives, he thought it might be problem.

Within a few months, Young's thoughts became reality. The energy costs were higher than expected and the copper-fin units were not up to the overall load requirements. "Sometimes engineers don't talk with the maintenance groups. The engineer and the school's building system board thought money could be saved by switching to the copper-fin boilers," said Young. "But they only looked at the initial costs, not the bills that come in every month." That was only part of the problem. On paper, the two 3.5 million BTU/hr., atmospheric boilers were enough to satisfy the requirements of the chemistry building. It readily became apparent, however, that the seven million BTU/hr. copper-fin boiler plant could not handle the real-world load.

"The boilers need to run year-round, for heating in the winter as well as to control humidity in the summer months. Despite higher than anticipated fuel costs, the copper-fins did meet the lighter Texas heating loads for most of the year, but once the outside temperature dropped below 50°F, the boilers could not keep up. We pushed them until they couldn't run any harder and one burned out," said Young.

After a year of inefficiency and poor performance, the decision was made to replace the copper-fin boilers with the three Benchmark 2000 Low NOx models (BMK 2000 LN) that had been originally specified. From the moment the six million BTU/hr. capacity plant came on-line, savings were realized and all loads were easily met. "In April of 2007, the copper-fin boilers used 1638 Mcf of natural gas. In April of 2008, we cut that by more than half – down to just 739 Mcf – because of the high-efficiency AERCO boilers," said Young.

The energy savings come from the design of the BMK 2000 LN boilers. In addition to their condensing design, they feature unmatched 20:1 turndown to minimize cycling and temperature overshoot. Together, condensing operation and best-in-class turndown can deliver operating efficiency of up to 99%, creating substantial seasonal fuel savings.

## AERCO's Solution

The success of the BMK 2000 LN boilers in the newly constructed chemistry building is only the most recent example of how AERCO has helped improve efficiency and reduce energy costs for UNT. In 2001, the university made the decision to replace the original steam boilers in the Wooten Building, which served as the main junction of a four-building hydronic loop. The challenge was to find a boiler that could increase efficiency, decrease costs and be maintenance friendly.

After extensive research, Young discovered the AERCO Benchmark boilers at a trade show. "After our initial research, we decided to talk to the local AERCO representative. We were impressed by the capabilities of the boilers, so we ordered three BMK 2000 units for the Wooten Building," said Young. "When they arrived, we nearly fainted. We couldn't believe boilers so small could manage the needs of a 228,000 square foot facility."

The BMK 2000 models replaced two steam boilers that were much larger. Each compact BMK 2000 boiler occupies a 12 ft. square footprint and can be installed in pairs with zero side-wall clearance. "Imagine replacing a boiler the size of a pickup truck with one the size of a refrigerator, and you can see why we reacted the way we did. But, boy, were we pleasantly surprised with the results," continued Young.

## Return on Investment

The BMK 2000 condensing boilers were installed in the summer of 2002. In January 2001, prior to the installation of the new boilers, the Wooten Building used 2250 Mcf of natural gas. With the BMK 2000 boilers in operation, gas usage dropped to 798 Mcf – a roughly 65% decrease – in January 2003. By January of 2007, usage was down to 418 Mcf.

"The efficiency of the boilers was impressive to say the least. Another key benefit was that the units required very little maintenance. We have had no problems with the boilers since installing them in the Wooten Building," added Young.

Based on the success of the Wooten Building retrofit, additional Benchmark boilers have been installed as replacement equipment and for new construction projects across the UNT campus – in the physical education building, dorms, biology building and sports facility, all with equal success. It was that track record that led to the BMK 2000 LN boilers being originally specified for the new chemistry building, and why Young and his team will continue to recommend AERCO for future projects.



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AERCO International, Inc. • 100 Oritani Drive • Blauvelt, NY 10913  
USA: T: (845) 580-8000 • Toll Free: (800) 526-0288 • AERCO.com