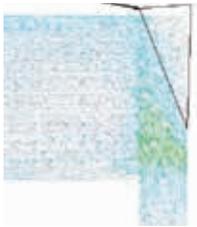


**ANSYS** + Weil-McLain

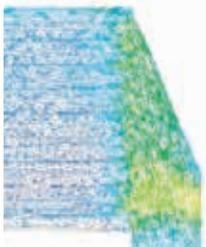
*Key Impacts*

- *Increased heat exchanger efficiency 86+ percent*
- *Cut \$300,000 in prototyping expenses*
- *Introduced new product to market six to 12 months faster*

## Computer Simulation Helps to Optimize Boiler Efficiency While Reducing Prototype Cost



Velocity vectors show a large area of stagnant, recirculating gas that promotes little additional heat transfer potential



A much higher average velocity is in contact with the back wall which will promote better heat transfer effectiveness

Weil McLain was challenged to develop a new three-pass, oil-fired, horizontal-flue water boiler with these conditions:

- Increase heat transfer efficiency and reduce combustion gas pressure drop
- Reduce six-month lead time to build and test prototypes
- Avoid prototyping ill-fated designs
- ~~Gain competitive advantage by speeding time-to-market, lowering design and production costs, and building superior products that are both unique and reliable~~

### Technology Used

ANSYS® Fluent® CFD

### Engineering Solution

Weil McClains's engineering team used CFD software to:

- Simulate and highlight performance of designs, specifically the effects on fluid flow patterns and heat transfer
- Guide selection of a final set of prototypes to choose the most efficient and economical design

A solid model of the design that had been developed using PTC's Pro/ENGINEER® computer-aided design software was imported into the ANSYS CFD pre-processor and prepared for analysis. Consultants worked with the Weil-McLain team to move the project along quickly.



### Benefits

- Increased efficiency of the heat exchanger to a near-industry-leading 86+ percent while keeping manufacturing costs low
- Eliminated the need for additional baffles, reducing design complexity, manufacturing requirements, maintenance issues and product cost
- Performed a series of rapid design iterations that took much less time and expense than relying solely on building and testing physical prototypes
- Saved approximately \$300,000 in prototyping expenses by using simulation to minimize the number of physical prototypes tested and made it possible to bring a new product to market six to 12 months faster than using traditional build-and-test methods.

### Company Description

Weil-McLain, a unit of SPX Corporation, is a long-established leader in the space conditioning and water heating industries. Based in Michigan City, Indiana, U.S.A., the company manufactures and markets the Ultra™ line of high efficiency gas and oil-fired boilers.