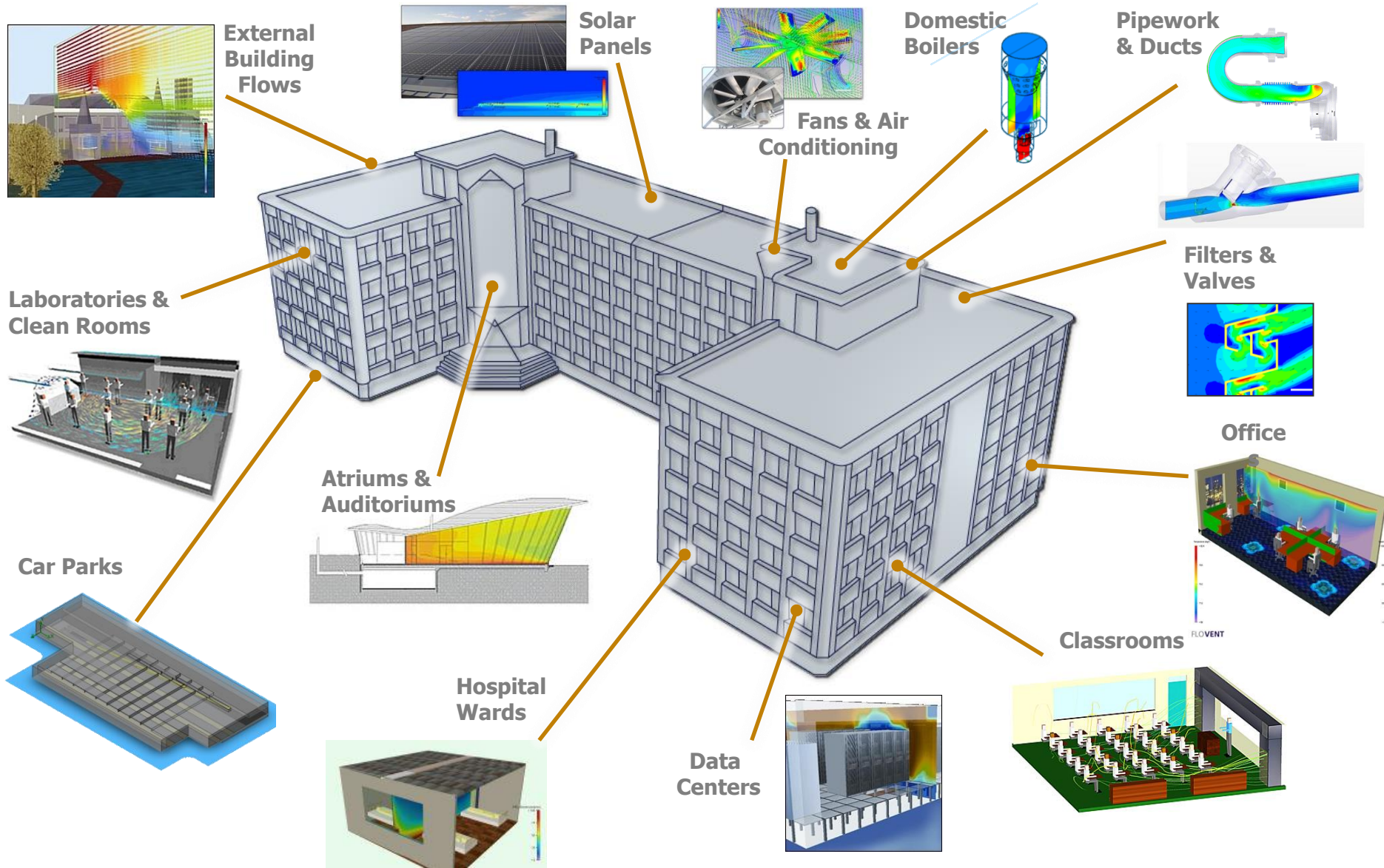


FloEFD Customer Success Stories: HVAC

Mechanical Analysis Division

11th November 2016

Mentor Graphics CFD applications in the HVAC & Built Environment Industry



Ingersoll Rand Energy Systems Improves Microturbine using FloEFD for PTC Pro/E

- Ingersoll Rand Energy Systems specializes in developing microturbines (70 & 250 kwatt) that supplement utility grids with cost-effective electrical energy that is reliable and safe for the environment.

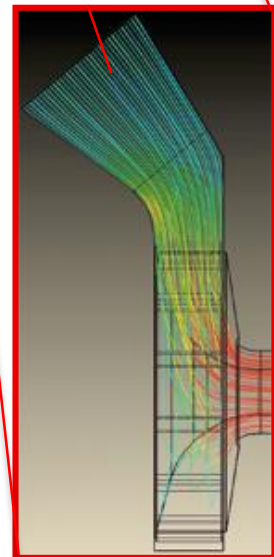
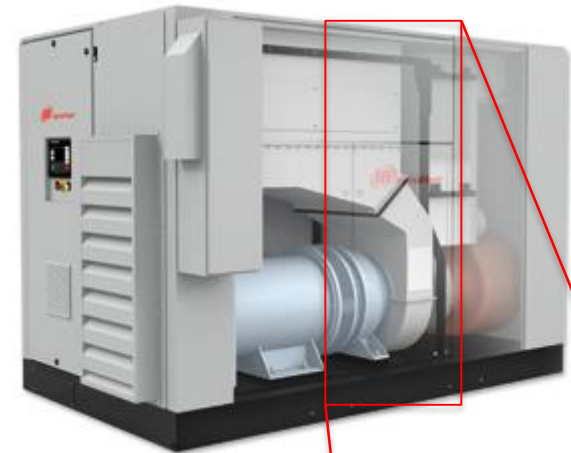
Challenge: Reduce the manufacturing cost of the MT250 microturbine engine without sacrificing overall performance.

Solution: FloEFD for PTC Pro/E and 15 design variants

Benefits: - New design offers lower pressure drop with improved compressor efficiency & better performance,
- Reduced manufacturing cost.

"With FloEFD software, we were able to evaluate 15 different alternatives very quickly and without cutting any metal. The new design improves assembly and serviceability by reducing installation time from 1 hour to 10 minutes. This was put into production only months after starting the evaluations."

Toni Stamenov, Design Engineer, Ingersoll Rand Energy Systems



HVAC

Bronswerk Develop Innovative Coolers and Fans with a Massive 15% Environmental Impact

- Bronswerk Heat Transfer BV in the Netherlands is a leading designer and manufacturer of heat exchangers, compressors and "Green" Coolers & Fans. Their air-cooled coolers are used as process coolers in the oil and gas as well as the chemical industries.

Challenge: Design a quiet air-cooled cooler/fan to meet stringent European Environmental Control Board standards

Solution: FloEFD for PTC Pro/E

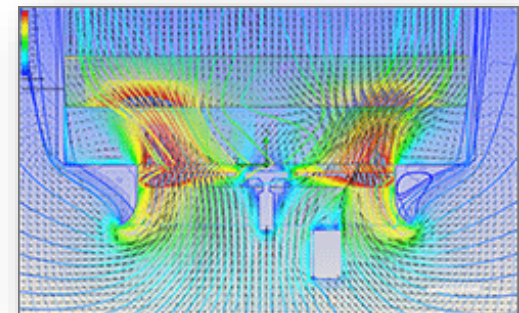
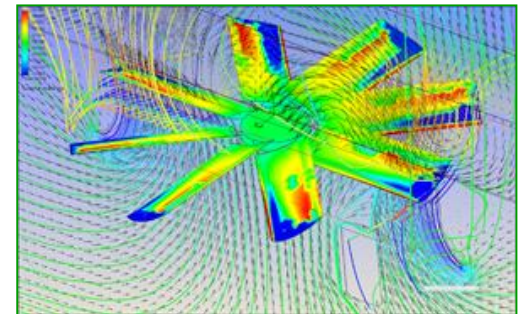
Benefits:

- Developed a groundbreaking design which achieves up to 80% thermodynamic efficiency - traditional designs only achieve about 60%
- Bronswerk product saves 15% of electricity usage & could result in 20% of generation capacity saving in Holland alone over the course of 10 years.

"FloEFD^{Pro} is a natural extension of traditional CFD that is easier to use and more intuitive for Mechanical Engineers. The information generated with FloEFD^{Pro} is far beyond data obtainable through experimentation and or measurement. We would not have been able to solve this challenge without FloEFD^{Pro}"

Guus Bertels, Senior Engineer, Bronswerk Heat Transfer BV

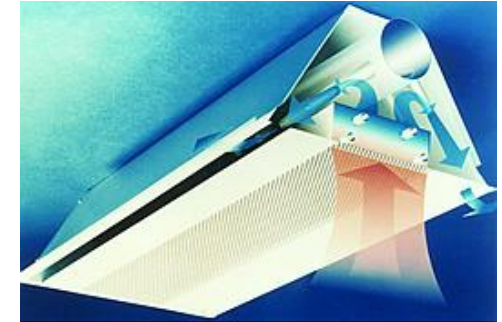
HVAC



TROX uses FloEFD to Produce 6 Months of Testing Results in 3 Weeks

- Leading HVAC air distribution system provider TROX UK has expanded its test facilities to include six separate test cells for comfort air conditioning, CO2 testing and product development as well as a leading edge CFD capability.

HVAC

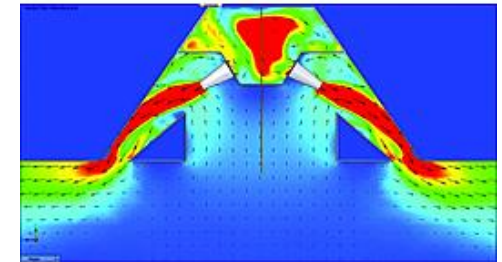


Challenge: Create a new high induction chilled beams that optimizes millions of combinations of air nozzle diameter, spacing, discharge angle, velocities etc.

Solution: Integrate FloEFD into existing design process

Benefits:

- Good agreement with experiment
- Develop products now without so many prototypes thus saving time and money
- CFD yielded 6 months testing results in 3 weeks



"FloEFD gave us 6 months testing and results in little over 3 weeks. We were then able to take the recommended options from the FloEFD analysis and conduct detailed full scale actual testing.. This means we can fine-tune the systems we are proposing, precisely matching the needs of our customers. And, because we do away with the need to manufacture a lot of prototypes, we save time and money for both our customers and for ourselves."

Cliff Bailey, Laboratory Manager, TROX UK

JAZO Cuts HVAC Housing Design Time from 3 Weeks to 1 Day



HVAC

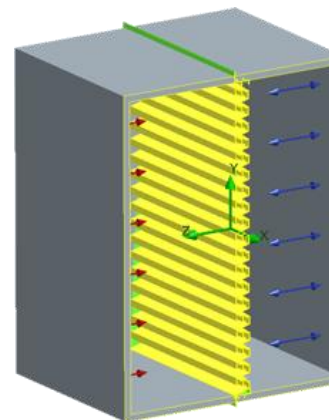
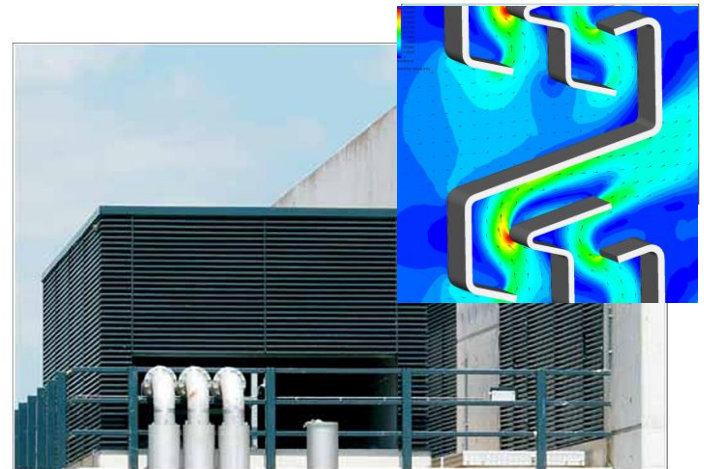
- JAZO Zevenaar B.V is an expert in designing & manufacturing protective housings for electricity, gas, telecommunications and boilers. These need to permit maximum airflow while fulfilling stringent requirements for fire, rain, snow, dust and intruder protection.

Challenge: Customize electrical housing design

Solution: FloEFD for PTC Pro/E

Benefits:

- Optimize form, fit and function of housings in less than one day
- Save 3 weeks on each test plus €2,500 per day for prototype testing



"We can show the finished design to our customer complete with how it looks and works in just one day – that's a savings of 3 weeks and thousands of Euros for each model."

H. Aaldering, Technical Director, Jazo Zevenaar B.V.