

# Bronswerk Heat Transfer BV Uses FloEFD<sup>Pro</sup>

MECHANICAL ANALYSIS  
Engineering Fluid Dynamics

## FloEFD<sup>Pro</sup> helps Bronswerk Heat Transfer BV Develop Groundbreaking Air-Cooled Coolers and Innovative Fans with Massive Environmental Impact

### Design Challenge

Bronswerk Heat Transfer BV is a leading designer and manufacturer of heat exchangers, compressors and fans. Their air-cooled coolers are used as process coolers in the oil and gas as well as chemical industries. They count companies such as Shell, Exxon Mobil, Bayer, Philips, Unocal and Texaco among their customers. Bronswerk fans cool large heat exchangers – often as big as a building. While designing a new generation of these industrial cooler systems and fans, the engineering team at Bronswerk faced a difficult challenge: to develop a new cooler and fan and make them as quiet as possible to meet stringent standards set by Environmental Control Boards (ECB) around the globe. ECBs are government organizations responsible for quality-of-life issues – any issue that protects the health, safety, and cleanliness of the environment. To further complicate the matter, the new fan design needed to cope with a wide range of environmental (wind gusts and building interference), fluids and pressure conditions.

### Solution and Benefits

Bronswerk used a combination of Pro/ENGINEER Wildfire from PTC and FloEFD<sup>Pro</sup> from Mentor Graphics. Since FloEFD<sup>Pro</sup> is fully embedded inside Pro/ENGINEER Wildfire, the combination of the two engineering tools enables Bronswerk to use a single design platform for geometrical design as well as mechanical and aerodynamic analysis without changing their design process.

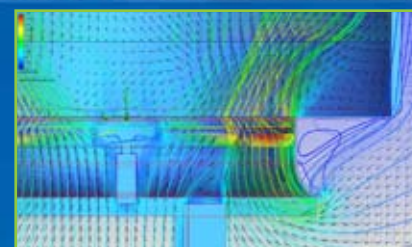
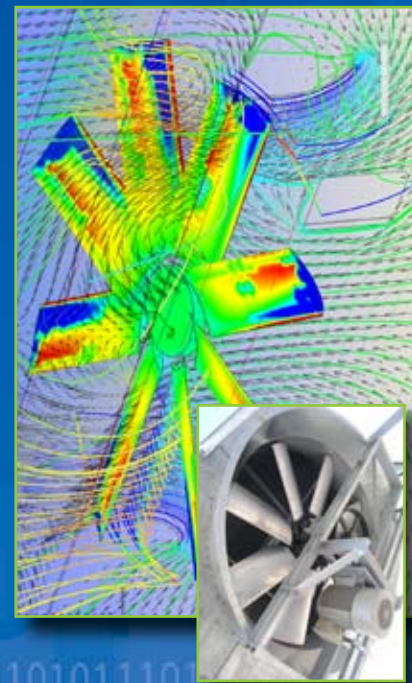
“Considering airflow through heat exchangers is even more complex than airflow through gas turbines, by using FloEFD<sup>Pro</sup>, we were able to make hundreds of variations in the geometry to fine-tune the fan and heat exchanger performance and reduce costs without sacrificing quality. Also FloEFD<sup>Pro</sup> has dealt very capably with our complex geometry” added Guus Bertels, senior engineer. “Our fans are large (2-10m). Each profiled cross-section is thick but tapers at the end to maybe to half a millimeter. The numerical challenge of dealing with dimensions ranging from meters to less than a millimeter is enormous. FloEFD<sup>Pro</sup> is mature enough so we can rely on it to understand the behavior of our designs down to the smallest significant detail.”

After fine-tuning their design, Bronswerk has created an innovative design that is a giant leap forward and years ahead of their competition. While traditionally such apparatus has a thermodynamic efficiency of up to 60%, their new designs based on new fans achieves up to 80% efficiency. The potential energy savings worldwide can be staggering as their product can save 15% of electricity it uses. These savings could result in 20% savings in generation capacity in Holland alone over the course of 10 years. “Our challenge was to develop the quietest cooler system. The added efficiency was an additional and unexpectedly huge benefit. Sometimes when you want to improve something you can’t just improve it a little bit. You need a large improvement to break through into uncharted territories.”

## Customer Testimonial

*“FloEFD<sup>Pro</sup> is a natural extension of traditional CFD that is easier to use and more intuitive for mechanical engineers. The information generated with FloEFD<sup>Pro</sup> is far beyond data obtainable through experimentation and or measurement. We would not have been able to solve this challenge without FloEFD<sup>Pro</sup>.”*

Guus Bertels, Senior Engineer



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