

Oil and gas

Bronswerk Heat Transfer BV

Major producer and designer of heat exchangers increases cooling fan efficiency with Siemens solution

Product

Simcenter

Business challenges

Increase cooling fan efficiency in large industrial plants

Decrease cooling fan noise in large industrial plants

Locate areas of pressure loss

Design completely new cooling system with minimal prototypes

Keys to success

Create air-cooled cooling systems

Validate design updates

Use simulation to obtain information on total pressure fields, nearly impossible to obtain through experiments

Results

Developed new cooling solution

Located pressure losses

Broke industry records for energy efficiency, noise reduction and weight savings

Bronswerk Heat Transfer uses Simcenter FLOEFD to locate pressure losses

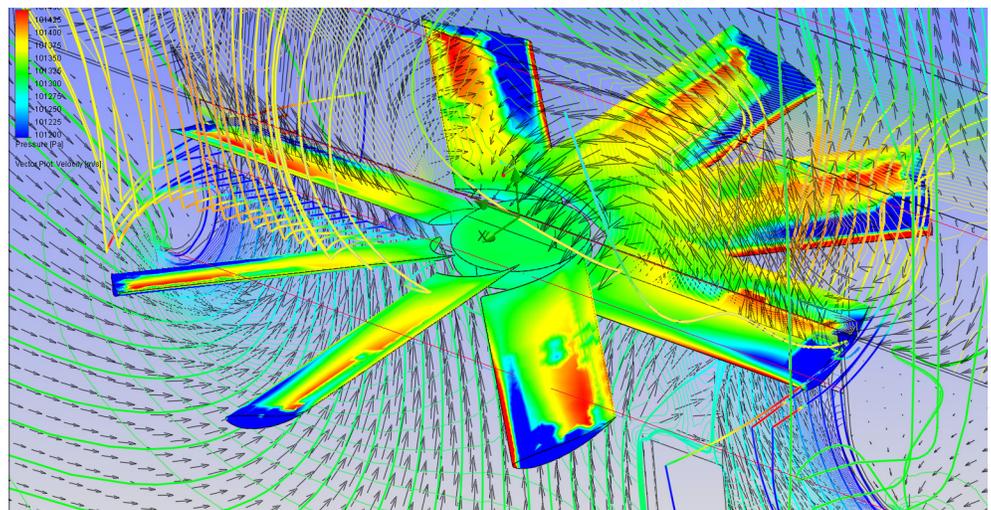
Founded in 1940, Bronswerk Heat Transfer BV specializes in the design and production of heat exchangers and condensers, air-cooled coolers and comprehensive systems. Focusing on high-quality, innovative solutions for heat exchanger issues, Bronswerk Heat Transfer BV has offices and locations in the Netherlands, the Czech Republic and Russia, employing approximately 300 people.

Bronswerk Heat Transfer BV designs, produces, and delivers industrial systems of (shell and tube) heat exchangers, cooling equipment, a-frame condensers, air-cooled

coolers (ACC) and fans. In addition, Bronswerk Heat Transfer BV supplies and provides maintenance services for process cooling systems around the globe.

Bronswerk Heat Transfer BV was recently tasked with increasing the efficiency of cooling fans at large industrial plants while simultaneously decreasing the noise emitted from those fans. In these facilities, fans as large as 33 feet move air across bundles of coils inside a gas or oilfield cooling system.

Dozens, even hundreds, of fan systems may be needed to cool the gas or oil, along with untold megawatts of electrical power to run these fans. Fan noise is as important as cost issues when it comes to regulations as large industrial plants are subject to stringent noise regulations. Fans traditionally used in this



“Most importantly, Simcenter FLOEFD gave us the opportunity to really understand the aerodynamics of air-cooled coolers for the first time because the flow and the aerodynamics are more than just a flow through the intake and the fan itself.”

Guus Bertels
Associate Director of
Advanced Design and Analysis
Bronswerk Heat Transfer BV



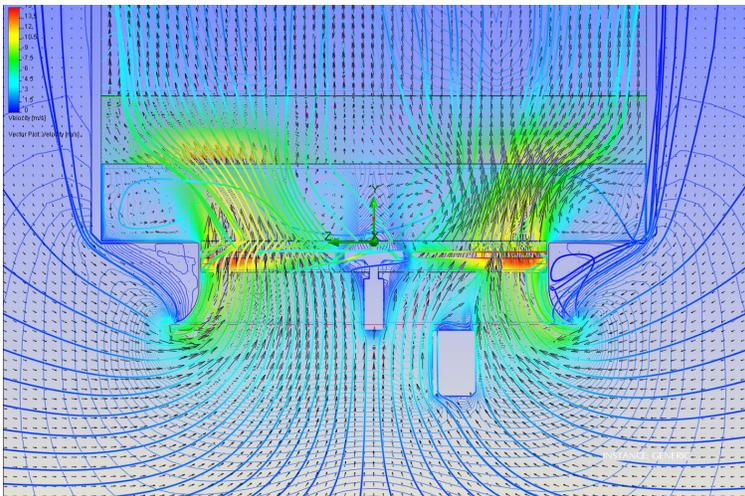
environment deliver a maximum efficiency of about 50 percent. What would happen if that efficiency could be increased to 80 percent? Or even more? Fewer fans could do the same work with less energy, less noise and lower operational costs. With this vision, the design engineering team at Bronswerk Heat Transfer BV set out to create a new generation of air-cooled cooling systems that would solve age-old problems.

Choosing Simcenter FLOEFD

Those Bronswerk Heat Transfer BV design engineers selected Simcenter™ FLOEFD™ software to develop an oil and gas industrial-plant cooling fan that is more energy efficient, quieter and lighter weight than its predecessors.

Simcenter FLOEFD enables analysis and validation that are impossible solely with physical measurements. Simcenter FLOEFD is a proven concurrent 3D computational fluid dynamics (CFD) toolset for analysis and validation of their design updates. Simcenter is part of Xcelerator, a comprehensive and integrated portfolio of software and services from Siemens Digital Industries Software.

Bronswerk Heat Transfer BV design engineers have used both CFD tools and physical measurements to characterize the behavior, particularly the aerodynamics, of large air-cooled cooling systems. They found that concurrent CFD often can produce data that would be impossible to acquire with measurements because of physical constraints, the Heisenberg principle, and other factors.



Breaking industry records

The new Bronswerk Heat Transfer BV cooling solution the design engineers developed includes fans and housings that take their technology cues from gas turbines, aircraft wings and a generous helping of home-grown creativity. Simcenter FLOEFD quickly and accurately validated the practicality of these creative touches. In addition to their purely quantitative output, the CFD simulations helped Bronswerk Heat Transfer BV explore bold ideas without risking project budgets and schedules.

“Simcenter FLOEFD was crucial because I couldn’t have proven it to myself or others that this design could possibly work so that

Solutions/Services

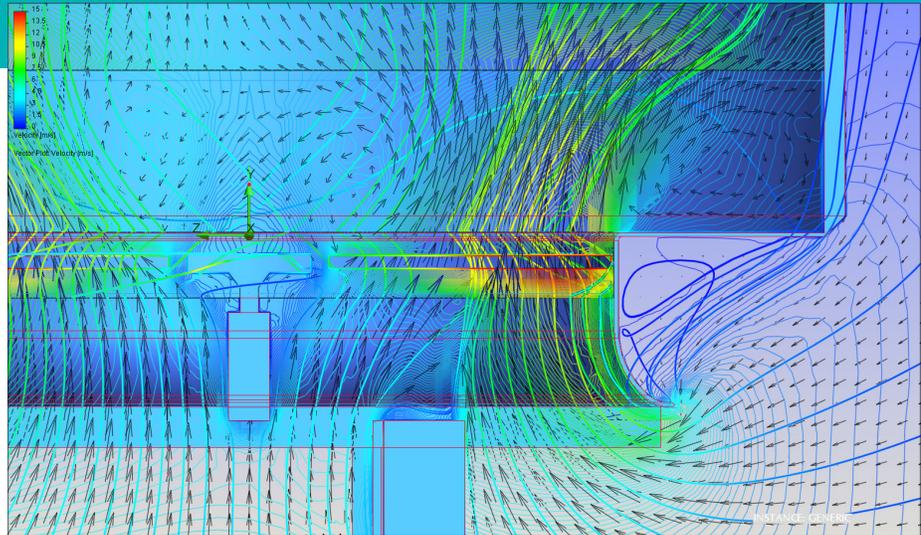
Simcenter FLOEFD
siemens.com/simcenter

Customer's primary business

Bronswerk Heat Transfer BV specializes in the design and production of heat exchangers and condensers, air-cooled coolers, and comprehensive systems.
www.bronswerk.com

Customer location

The Netherlands



we could start manufacturing prototypes,” says Guus Bertels, associate director of advanced design and analysis, Bronswerk Heat Transfer BV.

Physical measurements were essential to the project's success but couldn't produce the needed data in every case. With simulation, Bronswerk Heat Transfer BV's design engineers were able to look at static pressure distributions through a flow field and obtain information on the total pressure, which is a direct measure of the entropy in the system. A loss in total pressure is energy loss, and Simcenter FLOEFD delivered a clear picture of where the losses were.

Bronswerk Heat Transfer BV's Whizz-Wheel®-based cooling systems, which are documented to increase performance by up to 30 percent, reduce plot space and reduce noise and power consumption, are now breaking all industry records for energy efficiency, noise reduction, and weight savings.

“Most importantly, Simcenter FLOEFD gave us the opportunity to really understand the aerodynamics of air-cooled coolers for the first time because the flow and the aerodynamics are more than just a flow through the intake and the fan itself,” says Bertels.

“Simcenter FLOEFD was crucial because I couldn't have proven it to myself or others that this design could possibly work so that we could start manufacturing prototypes.”

Guus Bertels
Associate Director of Advanced Design and Analysis
Bronswerk Heat Transfer BV

Siemens Digital Industries Software

Americas +1 314 264 8499
Europe +44 (0) 1276 413200
Asia-Pacific +852 2230 3333

© 2020 Siemens. A list of relevant Siemens trademarks can be found [here](#). Other trademarks belong to their respective owners.
82130-C3 8/20 A

siemens.com/software