

Aprilaire

Customer Success Story

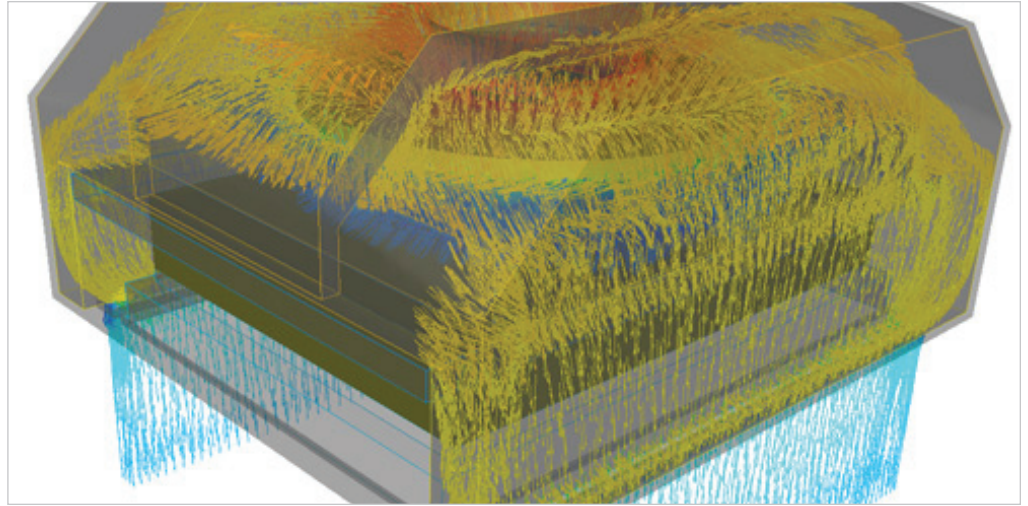
Autodesk® Simulation CFD

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—Tom Anoszko
Senior Design Engineer
Aprilaire

Finding the sweet spot.

With Autodesk Simulation CFD, Aprilaire pinpoints the most efficient path for air to flow in humidifiers.



Air velocity in different areas of the humidifier. Image courtesy of Aprilaire.

Aprilaire, based in Madison, Wisconsin, introduced the first evaporative flow-through-design humidifiers in 1954—and has been a technology leader ever since. Autodesk® Simulation CFD is a vital tool in Aprilaire's never-ending quest to walk the thin line between too much and too little humidity.

Before purchasing Autodesk Simulation CFD, Aprilaire's engineers relied primarily on their instincts and experience in the early design stages to project how air would flow through a humidifier. Prospective designs were tested with a plastic prototype and engineers physically measured the amount of airflow through the device. If the measurements did not match Aprilaire's specifications, design changes were made and another prototype constructed. Each design, prototype, and testing cycle took about three to five days, and the prototypes cost approximately US\$1,000 each to produce.

With Autodesk Simulation CFD, Tom Anoszko, senior design engineer at Aprilaire, estimates the typical design cycle for a new model of humidifier is reduced by a third, while quality has increased. "We are able to do many more iterations and use more creativity in our designs early in the design process," he says. "Quality is improved with Autodesk Simulation CFD because we have more time to do design iterations before committing. When we move forward with a design, we're confident it is the right one. We have very few problems on the back end, where tooling becomes involved and it gets expensive to make changes."

Anoszko says it doesn't make sense for Aprilaire to have a computational fluid dynamics (CFD) specialist in the company because CFD isn't an everyday task. This demands that the CFD software be intuitive enough for users to become productive with it quickly after not using it for long stretches. "Any of us on the team might go months without needing to use CFD," says Anoszko. "Fortunately, it's not difficult to get back up to speed with Autodesk Simulation CFD."

In a typical simulation, a Dassault Systèmes SolidWorks® model is launched into Autodesk Simulation CFD. A half-inch of pressure is set on one side of the humidifier's water panel and zero pressure on the other. The resulting 3D images in Autodesk Simulation CFD clearly show the air velocity in different areas of the humidifier. The goal is to eliminate pockets of low and high velocity, maintaining a consistent flow throughout the system.

"It's not a matter of the fastest airflow being the best," says Anoszko. "Beyond a certain velocity, you end up blowing water off the evaporative pad. You want to hit the sweet spot where you are delivering air across the face of the water panel as efficiently as possible."

After assessing results in Autodesk Simulation CFD, the humidifier model is revised in SolidWorks, and the simulation is run again. The cycle repeats until Aprilaire engineers achieve desired results.

To learn more about Autodesk Simulation CFD, visit www.autodesk.com/simulationcfd.