



When **Upsite Technologies**, leaders in data center airflow management, sought to design and market their unique **AisleLok® Modular Containment** system, they turned to the **Virtual Facility (VF)**. Harnessing the power of the VF's predictive simulation, Upsite's designers took AisleLok from concept to production in less than a year. In doing so, they enjoyed significant returns on investment measured in time, money and competitive advantage.

What is AisleLok®?

AisleLok is the industry's first modular containment solution specifically designed to provide the core benefits of containment with unique flexibility and value.

The Challenge

AisleLok consists of three components, each of which underwent an extensive design and optimization process. Following the design process, Upsite had to measure AisleLok's performance with different cooling and cabinet layouts.

They could achieve this solely by physical testing, but only at great expense. The alternative was to use both physical testing and computer modeling. For the latter, Upsite asked Future Facilities to help.

As experts in data center modeling, Future Facilities have for ten years been developing the **Virtual Facility (VF)** - a sophisticated 3D modeling tool that combines CFD airflow simulation with results visualization. The VF is a virtual lab/test bed that allows you to make design changes then analyze the effects. It gives you confidence at every step of the design process, allowing you to avoid surprises that might force the design to be started over from the beginning.

The entire AisleLok development cycle from concept phase, product design, development and product launch, took close to a year. But Upsite engineers proudly state that the design geometry and the unique design of modular containment solution resulted from just a few weeks' worth of CFD experimentation and analysis in the VF.



AISLELOK® COMPONENTS



THE FINISHED AISLELOK® MODULAR CONTAINMENT SYSTEM INSTALLED



“In the timeframe we worked to, we could never have achieved the AisleLok® Modular Containment design without the Virtual Facility.”

Using the Virtual Facility, Upsite engineers were able to visualize the effects of their design changes throughout the design cycle. It enabled them to demonstrate the difference in airflow pattern and temperatures in a non-contained versus a contained aisle, and to simulate and quantify the performance of baffles over a wide range of angles.

The VF allows for quick design refinements when compared to physical prototyping. There is a limitation on the number of points you can monitor and record in a physical testing process. By contrast, the VF presents results throughout the domain, allowing the engineer to concentrate their focus on the areas that are of greatest interest.

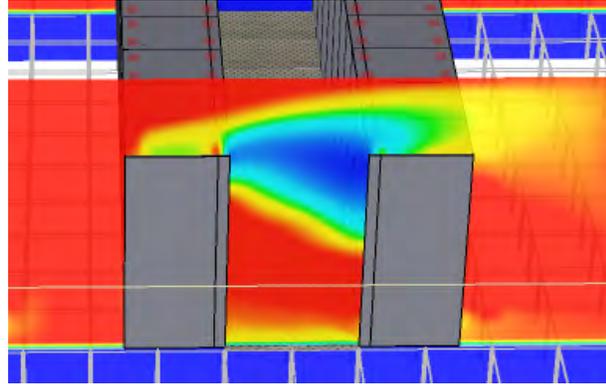
For Upsite, all these benefits helped to reduce the number of prototypes that were eventually built, and allowed them to test the best candidate in the lab and in actual data centers.

Conclusion

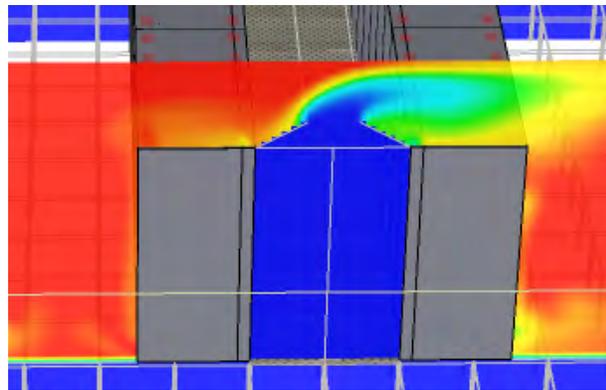
Imagine the same scenario without the use of the VF. What would be the cost of creating physical prototypes? More importantly, how long?

Upsite enjoyed a fantastic return on investment from the VF. Its engineers saved both tens of thousands of \$ and a great deal of time by using the VF to arrive at the optimum design - far more than the cost of the **6SigmaDCX suite** that powers it. The VF gave Upsite confidence to select the right design while simultaneously reducing the need to create physical prototypes.

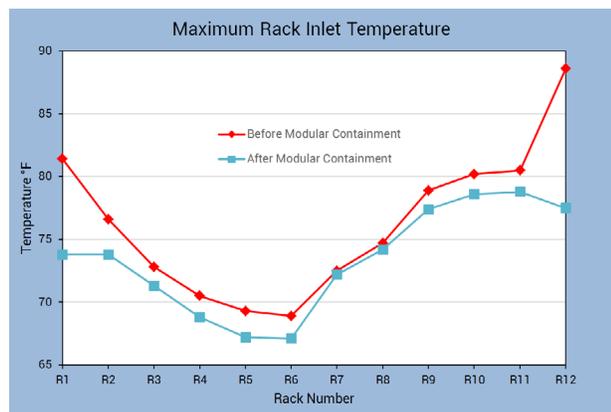
The VF has given the Upsite team reason to make the 6SigmaDCX suite a required decision making tool for future product development. It's a good example of how predictive simulation can save not only time and money, but also give a company an edge over its competitors.



(Above) The VF showed Upsite's engineers the aisle temperatures that would be experienced without containment. The VF offers a wide range of results visualizations, from results planes (shown here), to temperature clouds, streamlines, animations and fly throughs...



(Above) With AisleLok modeled, the same rows of cabinets now enjoy contained cooling airflow, as indicated by the solid blue section between the grey cabinets. The VF had proved that Uptime's unique modular solution would work before a single physical prototype was even manufactured.



(Above) AisleLok reduces the temperature of racks in multiple configurations across the board.