

Mestex Relies on FloVENT to Guide Innovative Warehouse HVAC Design

MECHANICAL ANALYSIS
HVAC

Design Challenge

Mestex (Dallas, TX) consults on commercial and industrial HVAC installations. Its client needed to protect valuable pharmaceutical products that would tolerate only $\pm 1.5^\circ$ F temperature variation, and knew from previous experience that a common rooftop system might have difficulty achieving this.

Mestex proposed an air turnover system housed entirely within the building, distributing air laterally rather than "dropping it" from ceiling registers. It was an unorthodox approach for this type of application, and its effectiveness had to be proved to both Mestex engineers and the client.

Solution and Benefits

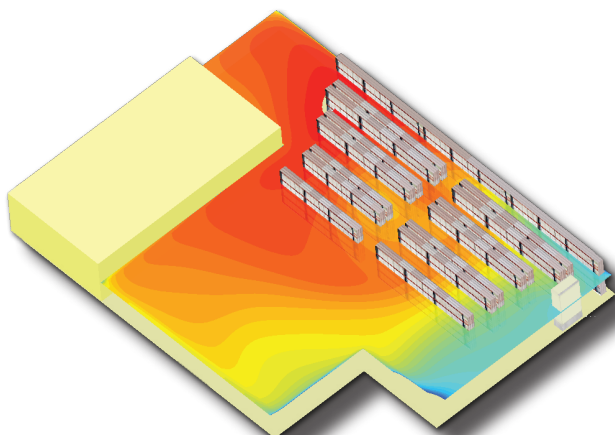
Mestex engineers ported 2D drawings of the warehouse building design into FloVENT and then constructed a 3D model of the proposed air turnover system. Model variables included supply air volume, velocities, diffuser locations, and more. Both temperature and airflow had to be balanced at every point in the building. Ultimately the simulation deployed 60

virtual sensors to pinpoint local conditions in every aisle, shelf rack, and corner.

These helped the designers ensure that not only were temperatures held within spec throughout the facility, but also that airflows were limited to 150 CFM to prevent sudden temperature changes in the stored pharmaceutical products. A FloVENT particle trace further confirmed that conditioned air was circulating efficiently.

FloVENT made it practical to test and re-test diverse variables of air distribution, temperature, and volume under worst-case winter and summer constraints. Almost 20 concepts were tried, each involving equipment and conditions that would have been impossible to prototype in the real world.

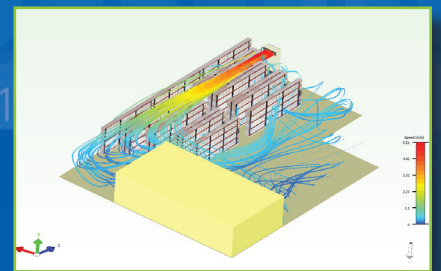
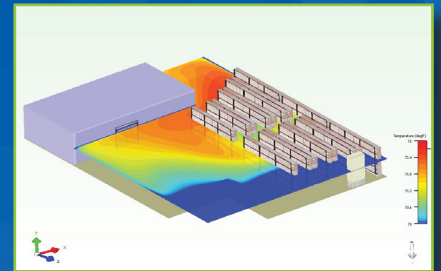
The Mestex-designed HVAC installation is now in place and operational. The system has met every requirement, and has done so while keeping hardware costs about 15% below competing solutions. Installation costs, too, were far below the norm. With no rooftop equipment, there were no costly ceiling penetrations or structural reinforcements required.



Customer Testimonial

"FloVENT accurately models complex heating and cooling systems, providing the temperature and airflow feedback we need to determine the effectiveness of our system design"

Mike Kaler, Mestex General Manager



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