

# Kling Optimizes Air Distribution in Laboratory with FloVENT

MECHANICAL ANALYSIS  
HVAC

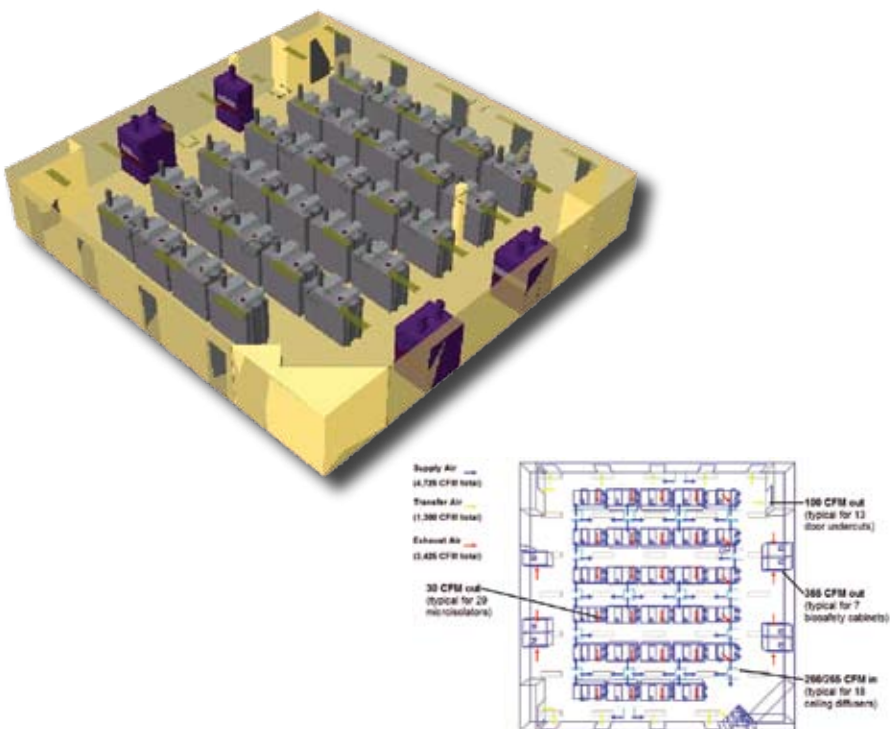
## Design Challenge

The presence of many microisolators posed a challenge in the air distribution system design of one room in a laboratory renovation project for a biopharmaceutical company. Conventional HVAC load and airflow calculations were not sufficient because they treat a single room's airflow in aggregate, and thus do not address internal issues such as the temperature of air supplied to the microisolators, thermal stratification of room air, geometric variation in air change rate, local heat dissipation of filtration fans, and the effect of other heat-generating equipment in the room. The challenge was compounded because of the non-rectangular room shape.

## Solution and Benefits

Multiple air terminal types, arrangements and throw patterns were evaluated in a series of FloVENT simulations to determine their performance in terms of temperature uniformity and local air change rate across the equipment aisles. Modeling was performed to derive a library of validated diffuser models before they were implemented and studied in the main room model.

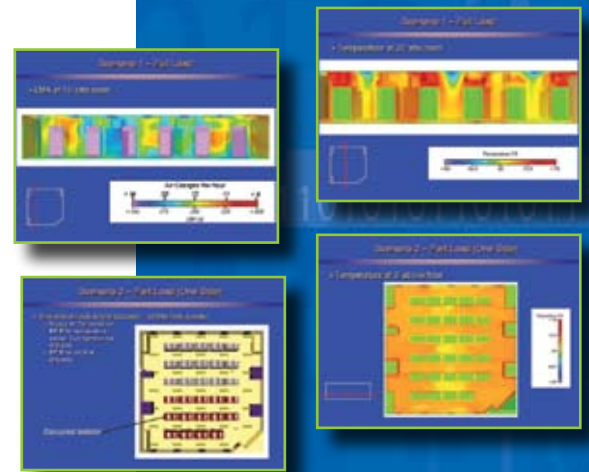
A scheme that includes mixing-type diffusers was chosen as the most appropriate and cost-effective for this particular facility. The air diffusers were placed around the perimeter of the room with throws away from the biosafety cabinets. Multiple microisolator utilization schemes were also simulated to ensure proper airflow performance under different thermal load conditions.



## Customer Testimonial

*"Without simulation, we would have had to use trial and error to adjust the HVAC design of the room after it had been built and occupied. These adjustments would have disrupted valuable laboratory research and increased operating costs. Instead, FloVENT results helped us make conclusions and optimize the final air distribution system design before construction. The model also helped us predict how the room could be used effectively with the existing HVAC air measurement and temperature controls."*

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