



TEMPERATURE CONTROL STUDY

SITUATION We wanted to better understand how air leakage in different types of data center ceiling systems can impact the efficiency of HVAC operations. After all, HVAC inefficiencies can drive up energy costs associated with cooling data center spaces.

OBJECTIVE Create and run a CFD (Computational Fluid Dynamics) simulation to compare and analyze temperature differences in data centers with drilled-hole or slotted-strut ceilings vs. those with DynaMax® Structural Aluminum Suspension Systems.

SIMULATION DETAILS

FACILITY SIZE

- 6,067 SF
- 25" RAISED FLOOR

CEILING SPECS

- 2' PLENUM
- STRUCTURAL SUPPORT BEAMS
- LIGHTING (ADDED HEAT)

HVAC SPECS

- 9 PERIMETER CRAC UNITS
- 13 PERIMETER PDUs

CABINET AIRFLOW

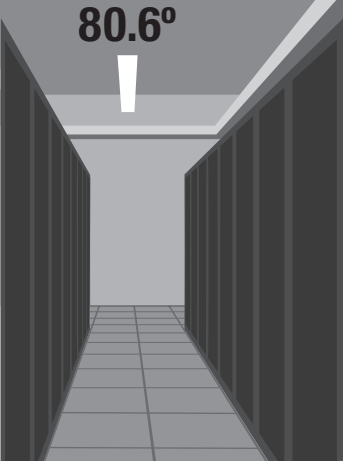
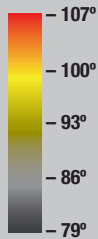
- 120 CFM PER kW OF HEAT LOAD

ALL-IN-ONE DYNAMAX® DATA CENTER CEILING SOLUTION

KEEP COOL

80.6°

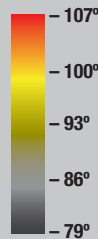
Temperature (F)



DYNAMAX® GRID

106.3°

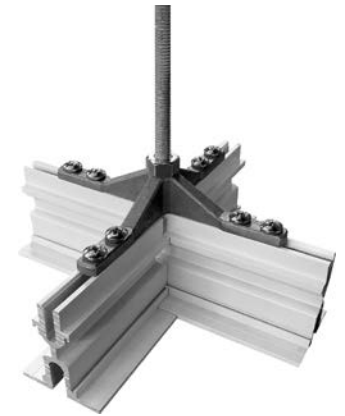
Temperature (F)



SLOTTED-STRUT

KEY FINDINGS Ceiling penetrations from cable trays, electrical distribution, and hot aisle containment leave open areas around supporting rods, reducing pressure in data centers and allowing warm air and dust to leak down from the plenum.

- Slotted-strut channels and drilled holes in the ceiling plane add areas for air leakage and increased hot air re-circulation
- On average, the top of data center cabinet equipment was approx. 26°F warmer with slotted-strut ceilings and 6°F warmer with drilled-hole ceilings (not shown) when compared to those with DynaMax® grid
- DynaMax grid eliminated the drilled holes and slotted-strut leakages, reducing top-of-rack temperatures
- Hot return air was contained within the plenum with the closed-plane DynaMax suspension system



TEMPERATURE & PRESSURE CONTROL

Maximize HVAC efficiencies in your data hall with DynaMax Structural Grid System. Cooler temperatures, improved air containment, and 900-lb. load-carrying capabilities.

STRUCTURAL ALUMINUM DATA CENTER SUSPENSION SYSTEM

DYNAMAX®



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CFD Simulation Video

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