

Wal-Mart's Experimental Store Offers Futuristic Peek At Retail HVAC Systems.

Placing fabric ductwork closer to the floor allows warmer/cooler air supply, drops energy costs.

MCKINNEY, TX—Wal-Mart's new experimental Supercenter in McKinney, Texas, proves American ingenuity is not dead. Some of the nation's best engineers produced state-of-the-art innovations when the 3,720-store chain challenged them to create what is perhaps the most environmentally conscious and energy efficient retail store on the planet.

The store boasts many emerging technologies that range from bioswales for cleaning parking lot rainwater to wind turbine and solar energy generation. However the HVAC and refrigeration systems are expected to produce some of the store's greatest energy savings, according to a Wal-Mart spokesperson.

Typical Wal-Mart Supercenter HVAC systems in southern states require approximately 450 tons of cooling and the air is distributed through metal duct/register systems mounted near the ceiling. The McKinney store's cooling is 380 tons. Much of the 70 tons of reduced cooling tonnage is a result of displacement ventilation on the sales floor made possible by fabric duct, according to Sean Timmons,

PE., principal, Timmons Design Engineers, because mounting the one linear mile of DuctSox fabric duct only 11 feet above the sales floor cools the bottom half of the store where it's needed most. The DuctSox have a linear array of holes that deliver supply air at a draft-less low velocity and moderate temperature of 65-68°F. After gently falling to the floor and mixing with air warmed by occupants and other heat sources, the air rises slowly to the upper levels of

Wal-Mart's Experimental Store - McKinney, TX

WAL*MART
SUPERCENTER

the store. Ceiling mounted return registers recycle the air back to the rooftop units where it is mixed with outdoor air and conditioned again.

The fabric duct also makes an environmental impact because hundreds of tons of metal weren't used for the duct system. Additionally, energy usage and labor during construction was reduced by half because the ductwork required half the man hours needed for metal duct installation, according to Michael Schloeman, vice president, CBS Mechanical Inc.

The energy-saving innovations go well beyond HVAC. The McKinney store is projected to save up to 300,000 kwh per year by using an ample amount of skylights and clerestories combined with light sensors and dimming controls that provide electric lighting only when needed. The reduction in electric lighting results in a lesser heat load for the air conditioning system to overcome.



With the McKinney store and a second experimental store in Aurora, Colo., Wal-Mart hopes to inspire the retail world to improve environmental sustainability.

According to Timmons, "With the advent of self-power generation, stores will become grid independent in the future along with lower cooling, heating, refrigeration and lighting loads. These stores will have an immediate impact on the industry as rival stores will need to keep pace with Wal-Mart's innovativeness in reducing the impact of super centers on the local environment and reducing operating costs over the long term." ■

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