



Workbook

Explore the Benefits of the Latest Solutions



DUCTS THAT ENDURE

DuctSox understands the market for fabric ductwork. Not only is it greener, but it performs in ways that metal simply can't.

By Russ Klettke

Building advances over the past century are about more than structural design and materials. They're also about the things we can't see—in particular air quality and temperature comfort.

Now the materials used for air ducts—think fabric ductwork versus metal—influence environmental and operating costs as well as occupant comfort and health. Just as noteworthy, the movement of air through fabric channels enables things that were never possible with metal ductwork.

Fabric ducts are already popular in big-box retail stores, swimming pools (natatoriums), huge structures like airplane hangars and sports stadiums, office workplaces, and data centers, among many other places. Add to that list indoor agriculture—the emerging industry that brings us locally grown crops like microgreens, basil, arugula, endives, and legal marijuana—as precision airflow further demonstrates its useful versatility.

The Evolution of Ductwork

The team at **DuctSox Corporation** has a good handle on how this works. Their fabric air dispersion products are custom-made for every installation and very often cost less to install and are easier to maintain than traditional metal ductwork. They also offer design flexibility for interior architects that is largely not possible with metal ducts.

To see how far we've come in this essential component of HVAC, it helps to consider where modern ventilation began. The earliest skyscrapers of New York, Chicago, and St. Louis—including the Empire State and Chrysler buildings in Manhattan—required their occupants to open windows in summer. Ventilation was achieved with thin buildings (for cross ventilation), operable windows, airshafts, doorway transoms, and platoons of electric fans. Those buildings upgraded eventually to mechanical cooling systems that required ductwork to deliver hot and cold air (with a \$500 million retrofit, the Empire State Building was LEED Gold-certified in 2011).

Metal ductwork has and remains the primary means by which air is distributed about most buildings. But with a greater attention to energy efficiency, along with a few decades of development in fabric ducts, the softer material is making headway into a variety of environments for a number of reasons.

Why DuctSox?

Each DuctSox system offers a variety of customizable airflow options to choose from. "The spacing of the orifices in DuctSox enable uniformly dispersed air flow," says **Kevin Gebke**, project engineer with the Dubuque, Iowa-based company, adding how most metal ductwork has more intermittently spaced outflow vents. While it's possible for metal ducts to imitate the size and hole placement of fabric ducts, that's almost never done because that would result in a more cost-prohibitive specialty product.

For building managers in almost every setting, the benefit starts with occupant comfort. The ASHRAE rating system gives

higher scores to DuctSox because the distribution of temperatures and air velocity provides superior comfort to room occupants. That's important for workplaces, but also consider the benefit to customers in retail spaces, restaurants, gyms, and more. There are no drafty spaces when the temps and airflow are consistent throughout.

Building and business operators appreciate the energy savings as well. According to Gebke—who cites an energy study conducted out of the Iowa State University Mechanical Engineering Department—fabric duct is 24.5% more efficient than conventional sheet metal duct and diffuser systems. The savings come from heating rooms faster and more uniformly, which reduces mechanical equipment runtime.

Serious Advantages

Additional green benefits begin before installation. The custom-designed system requires less material overall and saves on shipping because it weighs less and is less bulky. Because it's lightweight, it can be installed with lifts instead of cranes in large-scale, high-ceiling structures. Fabric ducts do not have condensation issues associated with metal ductwork and can be taken down to be laundered instead of the cumbersome and costly in-place cleaning required of metal systems.

Something else about fabric is that, unlike metal, it doesn't rust. That's not necessarily a problem everywhere, but it can be in natatoriums, which have high humidity.

As an added benefit, pools, as well as covered football stadiums and basketball arenas, are usually associated with a home team. School or franchise colors, logos, and

Consistent airflow, increased efficiency, lower shipping costs, easy installation, and cleaning are among the DuctSox perks.

DID YOU KNOW

FABRIC DUCT IS **24.5% MORE EFFICIENT** THAN CONVENTIONAL SHEET METAL DUCT AND DIFFUSER SYSTEMS



messaging are easily imprinted on the fabric. Conversely, fabric ductwork might be designed to disappear, in the same color of the ceiling and other surrounding elements. "It's all up to designers' preferences," says **Andy Olson**, director of marketing for DuctSox. "They can create a statement with colors, patterns, textures, and logos. Our in-house design team can match any color or create a custom pattern to meet the aesthetic needs of each individual space."

Another aesthetic feature, sound, can be managed effectively with DuctSox. Fabric doesn't have the resonance found in metal, for example, and that's a meaningful advantage in auditoriums, theaters, and recording studios.

More Options

Gebke and his team have developed additional product variations for very specific environments: LabSox for laboratory environments where fume hoods and low velocity airflow patterns are needed; KitchenSox for commercial food preparation where hygiene is a critical concern; and DataSox for the data center industry. A ChemSox product is used in caustic materials environments while a D-Fuser Filter helps block distribution of

"black spec" dirt from aging HVAC systems.

Meanwhile, the burgeoning indoor agriculture industry—some call it "vertical farming," as many such businesses are in multi-story buildings near urban centers—are finding ways to produce high per-square-foot yields of mostly organic vegetables in hyper-controlled environments. That means the growing media (soil and alternatives), light, and air movement and temperature are engineered to create optimal harvests. Controlling that air with DuctSox is itself all-natural, as its precision airflow can help create proper drafts in all the right places, reduce mold and mildew, and with 72% translucent material, keep light blockage to a minimum.

So while the ventilation of 100-plus years ago was about finding ways to escape natural weather conditions in newly dense urban centers, fabric ductwork now enables the opposite: Agriculture is engineered to take place in similar buildings in urban places. You may not be able to see that flexible, precision airflow—even if it comes in a bright, attention-getting tube tracing the ceiling—but one thing is certain: The results are green. ●



PHOTOS: COURTESY OF DUCTSOX