Project Case History

Destratification fans slash heating system cost while improving comfort in D.C. renovation

The Challenge: Find a way, during major renovation of office/warehouse facility, to minimize heating equipment cost while providing comfortable working conditions in large open spaces with high ceilings.

The Solution: Tjernlund destratification fans that move naturally-accumulated heated air from ceilings to occupied zones.

When the Balsan Group of Johnstone Supply, a Philadelphia and Washington DC area residential HVAC products wholesaler, purchased space in Waldorf, Maryland for its seventh branch office, Jerry McPeak, the group's Technical Service Advisor, was charged with designing the HVAC system. The project included total renovation of two adjoining 55 x 100 foot spaces, one for the office showroom and training room, the other for warehousing the company's residential HVAC products.

Sales/warehouse facility for Johnstone Supply's Balsan Group in Waldorf, Maryland.

McPeak's first priority was determining what utility services were available. The initial plan called for a ducted rooftop package to condition the air inside. "I did an initial inspection. One of the interesting things I saw out back, and thought odd, was a gas meter tree and lots of propane tanks," said McPeak. The space was previously used for manufacturing and was heated with infrared units.

McPeak needed more utility specifics to move forward. However, the utility company required him to submit an application for service before they would provide the information.

"It was early October and crunch time," McPeak stated. "The utility company still hadn't gotten back to us yet. So I had to look for a standard solution but couldn't find anything."

McPeak discovered the building was piped and metered for propane. So he decided on a Variable Refrigerant Flow (VRF) system of heat pumps for the warehouse side.

McPeak was initially told the warehouse ceiling height was 28 feet and a dropped ceiling would be installed in the showroom/office area. However, final measurements and load calculations were significantly different—the warehouse ceiling was 20 feet high and showroom/office drop ceiling was cancelled.

Heat loss calculations called for a lot more equipment than budgeted.

Another configuration under consideration was air rotation using 20-foot diameter fans. But the fans brought floor-to-ceiling height down to 14 feet, not high enough clearance with a forklift driving around and accessing product in the warehouse racking.

While McPeak wrestled with mechanical options, Frank Delfis, Balsan Group's top salesman, was

(Continued on other side)

D-STRAT™ fans in the 20-foot high ceiling of 5,500 square-foot warehouse direct heated air down to occupant working zones.

D-STRAT™ fans were used in showroom/office area to direct heated air down from 20-foot ceiling.

meeting with Chris Eyrich, representative for L&R Associates, a Tjernlund Products rep firm.

Destratification fan idea entered the picture at just the right time.

Delfis reported the following conversion scenario to McPeak:

Eyrich said to Delfis: "Because you're residentially oriented, you probably are not interested in this new destratification fan from Tjernlund. They're specifically designed to direct stratified heated air residing at high ceilings down to occupied zones in industrial and commercial buildings while only using 30 watts per fan.

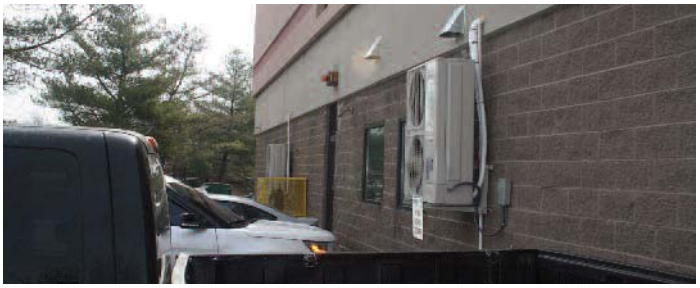
At that moment, a light bulb went off in Frank's head. "He knew I was in trouble with the new facility and told Chris: 'I'll tell Jerry he needs to talk to you.'"

McPeak called Eyrich the next day to get information about Tjernlund's D-STRAT™ fan.

Frank Delfis (l), Balsan Group salesman and Jerry McPeak (r), Technical Service Adviser collaborated on new branch facility HVAC system.

There was enough data in the literature so McPeak could calculate how to deploy these fans and determine the maximum air rotation in the space. With the fans mounted to the ceiling and extending down only 25 inches, there was over 18 feet of clearance available for the forklift. Eight D-STRAT fans were installed shortly thereafter.

"Those fans solved my air rotation problem with the ceiling height being where it was," noted McPeak.



The VRF system consists of two five-ton heat pumps supplying conditioned air to the showroom/office space.

The new branch's HVAC system consists of two 150,000 Btu unit heaters and four D-STRAT fans in the warehouse controlled by two speed controls plus two five-ton heat pumps in the showroom/office space. The VRF system is much like a "mini-split on steroids."

McPeak, a mechanical technology engineer, who considers himself a numbers guy, said: "The numbers are panning out on these fans. In fact, before getting our VRF system up and running, the D-STRAT fans were so effective they enabled us to maintain a comfortable temp during November and December using just a portable construction heater."

What's more, he pointed out how the black finished D-STRAT fans blend in perfectly with the black painted showroom/office area ceilings. "They are an efficient and non-obtrusive way to direct conditioned air down where it belongs and minimize equipment cost."

Black finished D-STRAT™ fans are practically hidden mounted in the black showroom ceiling.

> *"If there was only one thing on the Waldorf project that has performed as advertised it is those fans. They have effectively cut my heat loss by 40%. Air rotation at ¼ the cost. Now the owners want them in all the warehouses."*
> **Jerry McPeak**

TJERNLUND PRODUCTS, INC.
1601 Ninth Street White Bear Lake, MN 55110-6794
Phone: 651.426.2993 800.255.4208 Fax: 651.426.9547
Visit our web site: www.tjernlund.com