

# Making up for poor make-up air.

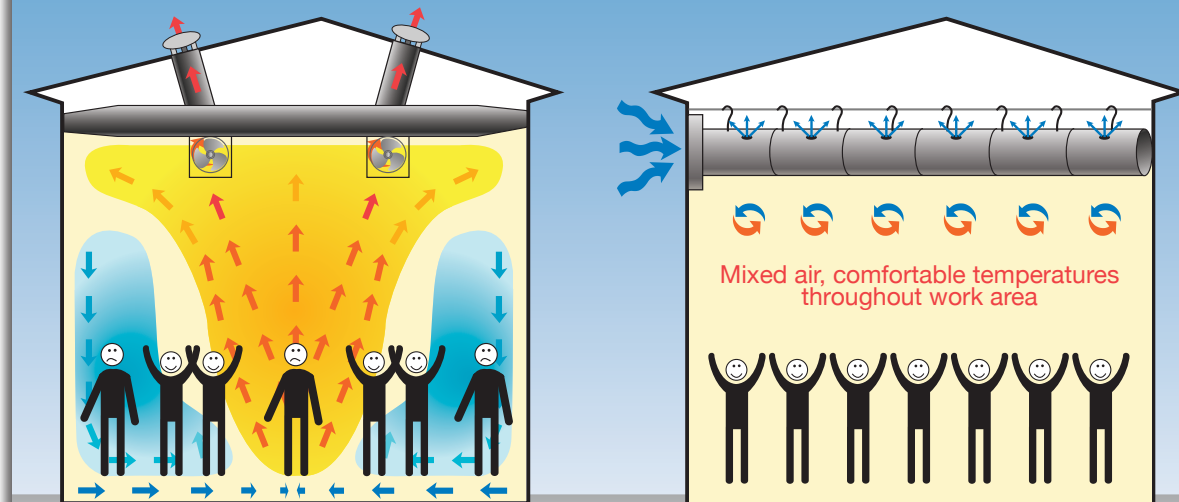
Control of air volume, flow and temperature is necessary to ensure a satisfactory working environment. Yet the ventilation systems in far too many buildings are not designed in accordance with the Industrial Ventilation Manual – and many with little regard being given to indoor air comfort.

In many buildings, especially older ones, the exhaust fans may do a good job of drawing contaminated air out of the building – but the make-up air is not being introduced in a controlled manner. In some cases the make-up provisions are woefully inadequate.

When the amount of air expelled exceeds the quantities brought in, the system becomes imbalanced, which causes negative pressure. If make-up air isn't introduced properly, outside air will get in through cracks, windows, doors – well, wherever it can – in an attempt to equalize the pressure.

**Result?** Cold floor drafts, hot ceiling air, chilly perimeters, and workers turning up the thermostats only to have the heat escape out the building's walls and roof exhausts. The people in the middle swelter, the people around the outside shiver and complaints abound. Not only that, people can feel sluggish and mentally slow when there is a lack of fresh air, leading to lower productivity.

And it's not just the people who are affected when large quantities of make-up air aren't replenished effectively. Reverse flows through gravity



*Left: Negative pressure creates heat stratification that causes chilly building perimeters, over-heated ceiling and center areas and uneven temperatures all around. Right: The installation of a SolarWall fan system balances pressure and evens out temperatures delivering fresh air throughout the building (best air inlet as per the Industrial Ventilation Manual of Recommended Practices).*

vents and chimneys can occur, and mechanical exhaust equipment runs less efficiently.

All in all, poor make-up air can really hurt a company's operation.

## The Solution:

Conserval's engineers followed the recommendations prescribed in the Industrial Ventilation Manual to develop a low cost solution whereby the SolarWall® fan system makes use of this stratified heat to warm the fresh intake air.

The system consists of a specially-designed air mixing fan unit that includes modulating dampers and proportional temperature controls (all pre-wired for easy installation). This unit can draw air in either through the wall or through the roof hood. Air is introduced into a flame retardant polyethylene duct, which can span the entire length of a building, distributing fresh air throughout the facility. The ducting, which is available in many stock diameters

and three different configurations, is hung close to the ceiling from a cable using special hanger hooks.

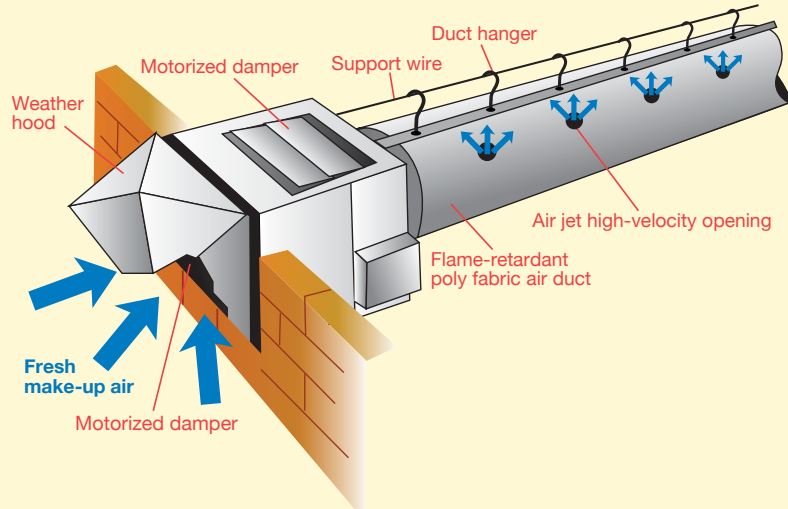
The ducting contains precision jet openings to provide air distribution; each duct is custom perforated and engineered to meet the specific needs of each building.

**How does it work?** When the SolarWall fan unit is started, the motorized outside air damper opens and starts to work with the inside air damper to maintain a constant discharge air temperature. The air is released through the duct's numerous small openings at high velocity, as close to the ceiling as possible. The fresh air immediately mixes with the hot air at ceiling level, creating a comfortable mixed air temperature for the lower work areas of the building.

Result: Day or night employees benefit from the uniform air temperatures.

When no fresh air is needed, the system can be easily shut down, which automatically closes the outside damper.

## Typical through-the-wall type installation



Indoor air is balanced and heated using the building's stratified heat.

## The upside of controlling the updraft.

By helping to control the air flow more effectively, SolarWall ventilation systems enable companies to reclaim wasted building heat, while improving the overall operating efficiency. Specifically, this i) heats fresh air for free, ii) eliminates hot and cold areas throughout the building, and iii) eliminates the problems associated with negative pressure conditions.

## No hot air wanted!

Obviously the sound of distributing *heated* air more evenly through the workspace has little appeal in summer. SolarWall ventilation systems come in two

modes to allow for wide fluctuations in seasonal temperatures.

The winter mode has fixed air jet hole positions to enable the stratified heat under the ceiling to be easily mixed with outside air as described above. The summer cooling mode has its holes pointing down to direct the unheated air onto the work floor. The summer/winter mode ducts have an internal flap to cover one set of holes, which allows the duct to blow air upwards in winter and downwards in summer.

As a result, the increased air circulation and enhanced temperature balancing that improve winter comfort levels also work well in summer. In fact, it works so well that many clients are able to use a SolarWall ventilation system as an effective alternative to air conditioning in providing a comfortable work environment throughout the hot summer months.

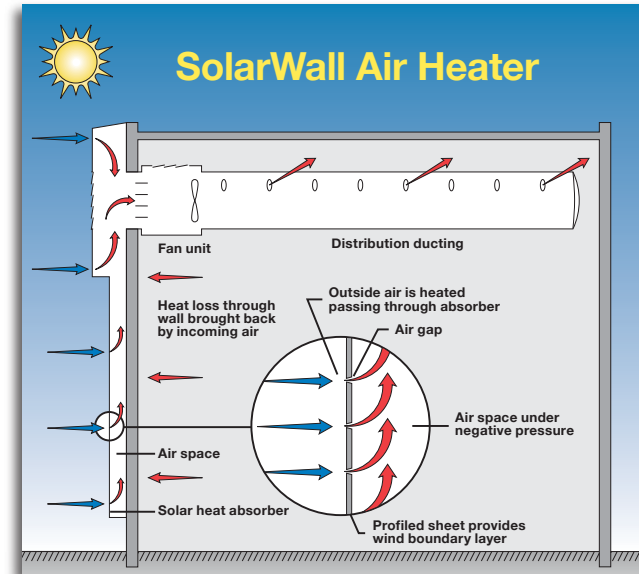
## A practical means of following Industry Best Practice.

In the Industrial Ventilation Manual of Recommended Practices, published by the American Conference of Governmental Industrial Hygienists, it states that an excellent means of introducing “non-turbulent air to a facility is to pass air through a

supply air plenum built as part of the ceiling and/or through perforated duct” and advocates the use of a “perforated duct for ceilings over 15 feet”. SolarWall’s industrial ventilation systems have always followed this industry best practice.

By installing SolarWall ventilation systems, a healthy indoor environment is created cost effectively... and by eliminating the air temperature stratifications within the building, heating costs are reduced and employee comfort is increased.

To learn more about how you can benefit from “controlling the updraft”, please call us or visit us on-line.



Here, the indoor air is heated through the combination of a SolarWall heater and the building's stratified heat.



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