

1-1-2012

NightBreeze™ : Integrated Heating, Ventilation and Cooling System

Purdue ECT Team

Purdue University, ectinfo@ecn.purdue.edu

DOI: 10.5703/1288284315846

Follow this and additional works at: <http://docs.lib.purdue.edu/ectfs>



Part of the [Civil Engineering Commons](#), and the [Construction Engineering and Management Commons](#)

Recommended Citation

ECT Team, Purdue, "NightBreeze™: Integrated Heating, Ventilation and Cooling System" (2012). *ECT Fact Sheets*. Paper 137.
<http://dx.doi.org/10.5703/1288284315846>

This document has been made available through Purdue e-Pubs, a service of the Purdue University Libraries. Please contact epubs@purdue.edu for additional information.



NIGHTBREEZE™: INTEGRATED HEATING, VENTILATION AND COOLING SYSTEM

THE NEED

Carbon FRP Grid Structures for use in reinforcing concrete On summer evenings in many areas of the country, people open windows to ventilate their homes with outdoor air, both to obtain natural cooling and to remove stale air. The cool air absorbs heat from warm interior surfaces and furnishings. In the morning, windows are closed and the cool surfaces absorb heat during the day, keeping the house cool and comfortable. Houses with more massive walls and floors store this “coolth” more effectively. The lower the temperature the house reaches at night, the more comfortable the house stays during the day. Managing windows in this manner reduces the need for air conditioning and saves energy, but personal schedules and security concerns may interfere with using windows for ventilation. Also, there may not be sufficient outdoor breezes to adequately flush the house with cool air. NightBreeze™ provides ventilation cooling automatically, eliminating the necessity of operating windows (though it is still good practice).

THE TECHNOLOGY

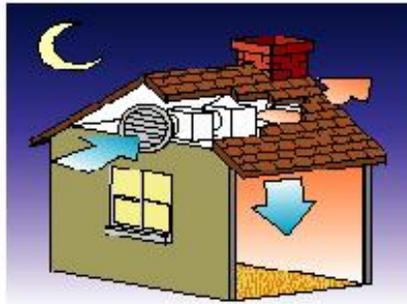
NightBreeze™ uses the heating/air conditioning system fan to bring in filtered outside air and flush out warm, stale indoor air. The system also allows you to select the lowest temperature you want the house to reach overnight. As the weather becomes milder, the system automatically decreases the amount of ventilation to prevent the house from being over-cooled. Unlike gas furnaces that obtain heat directly from combusted gas, NightBreeze™ circulates water from your water heater to a coil that is similar to the radiator in your car. A blower circulates air through the warm coil and into your house. The speed that the blower operates varies with the amount of heating that is needed, and thus it is very quiet. Most of the time you may not even be aware it is running.

THE BENEFITS

- Reduced heating and cooling loads significantly affecting the overall equipment capacity.
- Does not require additional energy for per-heating as in case of HRVs.



- No additional relative humidity control systems are required. ERVs also transfer the humidity level of the exhaust air to the intake air.
- The need for condensation pans and drains is eliminated as all the moisture is transferred in vapour form.
- As an example, when outdoor air is 95°F (35°C) DB and 75°F (24°C) WB (40% RH), and indoor air is 75°F (24°C) DB and 50% RH, the ventilation air is conditioned by the ERV System to enter the building not at 95°F (35°C) DB and 75°F (24°C) WB but on the order of 79°F (26°C) DB and 51 % RH.



• **FIGURE 1 A SCHEMATIC SHOWING OPERATION OF THE NIGHTBREEZE™ TECHNOLOGY**

STATUS

Many firms provide this product. Some commercially available products include: ClimateMaster Inc., Rx ERV Honeywell Energy Efficient Ventilators Davis Energy Group Inc.

Many contractors are still unaware of such technologies but its use is increasing in new building constructions for designing HVAC systems.

REVIEWERS

Peer reviewed as an emerging construction technology

DISCLAIMER

Purdue University does not endorse this technology or represents that the information presented can be relied upon without further investigation.

PUBLISHER

Emerging Construction Technologies, Division of Construction Engineering and Management, Purdue University, West Lafayette, Indiana