

INVENTIONS & INNOVATION

Success Story



SELECTIVE ZONE ISOLATION FOR HVAC SYSTEMS

Method for Restricting Air Flow for Selected Zones Within a Building

Benefits

- ◆ Has saved 240 billion Btu through 2000
- ◆ Saves 20% to 30% in a typical heating and cooling bill
- ◆ Saves about 17 million Btu per year for a typical home
- ◆ Has saved 15,000 tons of CO₂ emissions and avoided over \$1 million in energy purchases through 2000
- ◆ Could save over 1 trillion Btu nationwide through 2010

Applications

Restricts heating and cooling in home areas that are not in use. This product is suitable for any size home with a central HVAC system. It fits through existing ducts in retrofit applications.

Awards

Flexdamper inflatable retrofit damper was rated "Best of What's New" by *Popular Science* magazine.

A significant amount of energy is wasted by heating and cooling unoccupied areas of residential homes. Energy can be saved using zone isolation, where the heating or cooling is turned off to parts of the home not being used. Typically, zone isolation requires manual closing of ducts or separate heating systems with thermostats set to appropriate temperatures for each zone.

The U.S. Department of Energy's Inventions and Innovation Program funded EnerZone Systems to develop a method for selectively controlling airflow to rooms in the home from a central HVAC system. It allows one HVAC system to tailor heating and cooling to the areas of greatest need. The system uses EnerZone Systems' Flexdamper[®] air control inserts coupled with an electronic controller and air pumping system. Flexdampers inflate as needed to restrict airflow to unoccupied areas and deflate quickly to allow full airflow when occupants return.

Flexdampers are remotely powered by air, so no bulky motor is present on the outside of the damper to hinder installation. Round or rectangular Flexdampers are easily installed into new ductwork or retrofitted into existing ducts. The Flexdamper can be folded or bent and inserted through a register or other small openings, making it a viable option for retrofitting ducts that have been covered with sheet rock or other obstacles. Flexdampers can be serviced from the register or plenum, with no need to access the interior of a duct.



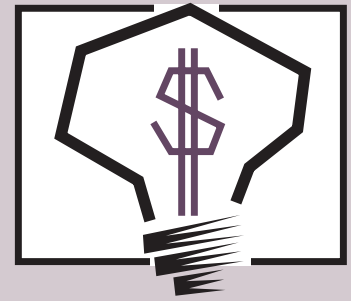
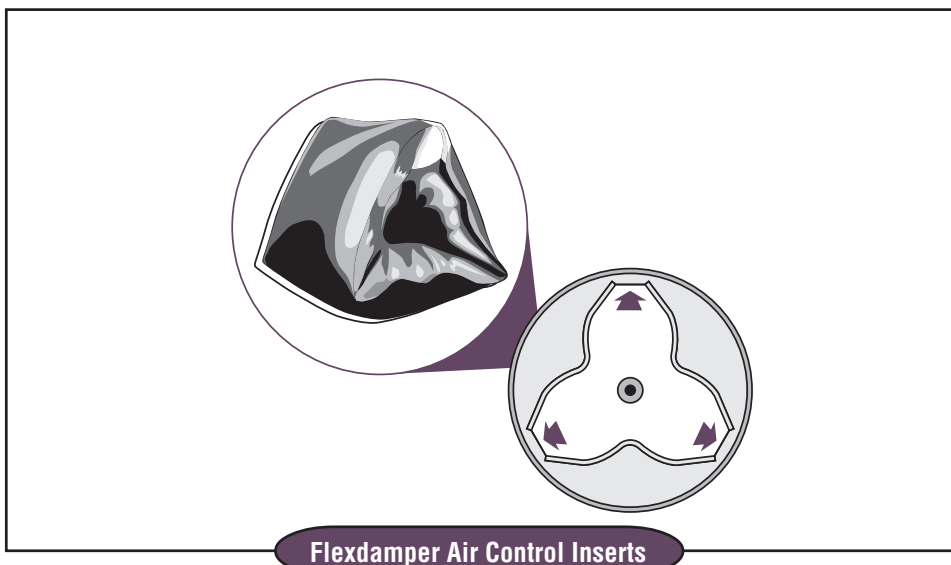
Flexdampers for Round and Rectangular Ducts



The Flexdamper does not need special support and works well for suspended duct applications. Trim-to-fit sizing by the installer allows the rectangular Flexdamper to fit several sizes of duct, including nonstandard sizes. A long-lasting, continuous-duty pump provides both pressurized air and a vacuum to open and close the Flexdamper. One pumping system with a thermostat control is sufficient for most applications and can drive one or more Flexdampers.

Energy Savings and Economics

Most Flexdamper installations are in larger homes and save more than an estimated 5,000 kWh per year, depending on energy use and climate conditions. In addition to energy savings, cost savings of up to \$2000 per system can result from stretching the capacity of the HVAC system. More than 3,500 Flexdamper systems currently in use are saving over 60 billion Btu per year. Cumulative energy savings have totaled 240 billion Btu through 2000. Cumulative savings from avoided energy purchases exceeded \$1 million through 2000 using inflation-adjusted 1999 dollars. The associated cumulative reduction in CO₂ emissions from avoided electricity generation is about 15,000 tons through 2000. Assuming a 20% growth rate, almost 1 trillion Btu will be saved through the year 2010 and almost 65,000 tons of CO₂ emissions eliminated.



The Inventions and Innovation Program works with inventors of energy-related technologies to establish technical performance and to conduct early development. Ideas that have significant energy-savings impact and market potential are chosen for financial assistance through a competitive solicitation process. Technical guidance and commercialization support are also extended to successful applicants.

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