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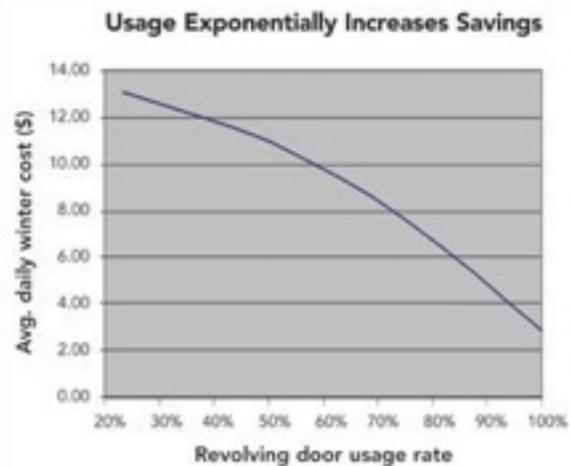
SOLUTION ALERT #1

Revolving Doors as a Retrofit Project

- On average, eight times as much air is exchanged when a swing door is open as opposed to a revolving door
- Revolving doors cut down on that filtration somewhere between 80 and 90%.
- Two revolving doors could save almost \$7,500 yearly in natural gas to heat & cool or 15 tons of CO2.
- If the average daily cost of energy due to air leakage was \$13.00 during the winter, a 75% usage rate of revolving doors drops the cost to ~\$7.50 while 100% usage would drop it to ~\$2.50.

Looking for a way to enhance your entrance systems? It may be time for a revolving door retrofit.

By [Christopher Curtland](#) (assistant editor of BUILDINGS.)



An MIT study found that as revolving door usage rises, energy savings increase exponentially. The study also implemented and examined strategies to encourage usage, like posting signs and locking swing doors.

[Doors](#) are made for opening and shutting, but the impact of entrance systems on building costs isn't an open-and-shut case. Revolving doors can generate savings, benefit operations, and attract occupants and tenants.

“The goal of a door is to get you from outside to inside and vice versa, but there are great differences you may not even notice,” says Paul Hendlin, director of client services for manufacturer Controlled Access Inc. “The door itself has certain properties you might not be aware of.”

ENERGY SAVINGS

Whenever a door is opened, there is air exchange from outside to inside that affects HVAC loads and energy efficiency. “That air infiltration, and thus energy loss, depends on how many times it’s open, how large the opening is, and how long the opening lasts,” says Tracie Thomas, marketing manager for manufacturer Boon Edam Inc. “Revolving doors provide the least infiltration possible – they’re always open but also always closed.”

“On average, eight times as much air is exchanged when a swing door is open as opposed to a revolving door,” Thomas explains. “Revolving doors cut down on that filtration somewhere between 80 and 90%.”

An MIT study, *Modifying Habits Towards Sustainability: A Study of Revolving Door Usage on the MIT Campus*, considered the effects of revolving doors at several locations on campus. Researchers discovered that two revolving doors at one building could save almost \$7,500 yearly in natural gas used to heat and cool, amounting to nearly 15 tons of CO2 emissions. Efforts could save 75,000 kilowatt hours of energy per year. Average daily cost of energy due to air leakage at MIT was \$13.10 during the winter, but a 75% usage rate of revolving doors drops the cost to \$7.66 while 100% usage would drop it to \$2.83. The study found a usage rate of about 68%.

The study also examined methods to increase usage, like posting signs, distributing flyers, and locking swing doors. “The return on investment can be just a few years, depending on door model, building type, and climate,” Thomas says. “Typically you can have one retrofitted inside of one week.” However, improved energy efficiency is just one motivator for a retrofit, Thomas adds.

OPERATIONS

Security is an important consideration with revolving doors. Some offer features like card readers for controlled access and a breakaway element that allows the centerpiece to collapse, fold, and present an open passageway in case of fire or emergency.

“A sensor can detect if more than one person is trying to get through and lock the door to prevent tailgating and piggybacking,” Hendlin explains. Common entrances include two sets of doors, creating a vestibule that limits air exchange, but a revolving door allows you to reclaim that space.

“Twelve extra feet of space for that vestibule is a luxury not afforded to many facilities,” Thomas says. “In addition to space and comfort, revolving doors also make for a cleaner and quieter lobby because it isn’t directly open to wind and street noise.”

Swing doors can also be difficult to open because of stack pressure and the chimney effect. “When a building is heated, the hot air rises, and pressure sucks the door in,” Thomas explains, adding revolving doors don’t have that problem and automation eliminates the need to push altogether.

AESTHETICS

“The main keys are safety and operation, but aesthetics are also important,” Hendlin stresses. Revolving doors can be finished with bronze, high-polished chrome, or a number of other metals and customized with paint and different glass.

“Swing doors can look kind of plain,” Thomas says. “You should consider whether the door design adds character to the facade.”

In downtown or high real estate markets, revolving doors are a popular choice and can attract high-rent tenants, she adds. “The door is the first thing people see and walk through. It’s the first feeling they have about the building itself,” Thomas says. “A revolving door can look very stylish.”