Going Green with Central Vacuums

By

Stephen R. Klossner

Energy & Environmental Building Association (EEBA)

Builders and homeowners, alike are embracing central vacuum systems to assure healthier living environments. It's one of the fastest growing trends in the rapidly evolving green building movement. Although green building began as an effort to use forestry and water resources more efficiently, its emphasis quickly grew to embrace products and practices that would reduce energy consumption both during and after construction. Today, green building also emphasizes indoor environmental quality to produce homes that are healthy places to live.

According to Boyce Thompson, editorial director for *Builder* magazine, the leading publication serving the nation's homebuilders, the green building movement experienced major growth in 2007 in spite of a sharp drop in overall building activity.

"Within the last half year, we've seen an exponential increase in builder interest in green building. That's no doubt because more and more potential home buyers are asking for healthy, energy-efficient homes. But it's also because builders have seized on green building as a way to differentiate new from existing homes," notes Thompson.

Indoor Air Quality

According to the U.S. Environmental Protection Agency (www.epa.gov), the air inside a typical American home can be five to 100 times more polluted than the air outdoors. Indoor pollutants typically include combustion gasses, organic vapors emitted from solvents, adhesives and building materials and other biologicals such as molds, allergens and dander. The tighter the home is built to conserve energy for heating and cooling, the less fresh air gets inside to dilute indoor pollution levels and there are fewer ways for pollutants to be removed.

A central vacuum system consists of three major components: a power unit that includes the motor, filtration system and a receptacle that collects the dust and allergens captured

by the vacuum; the central vacuum hose, cleaning tools and an electric power brush for cleaning carpet; and a network of built-in inlet valves and inside-the-wall tubing that connects the hose to the power unit.

Because the power unit is typically installed in a garage, basement or utility room, its motor exhausts no air through the living area during cleaning. Instead, all of the captured dust and allergens are safely removed. And because the power unit is permanently installed, it can accommodate a motor with up to five times more cleaning power than a traditional upright vacuum, assuring that more dust and allergens are collected.

Proven Allergy Relief

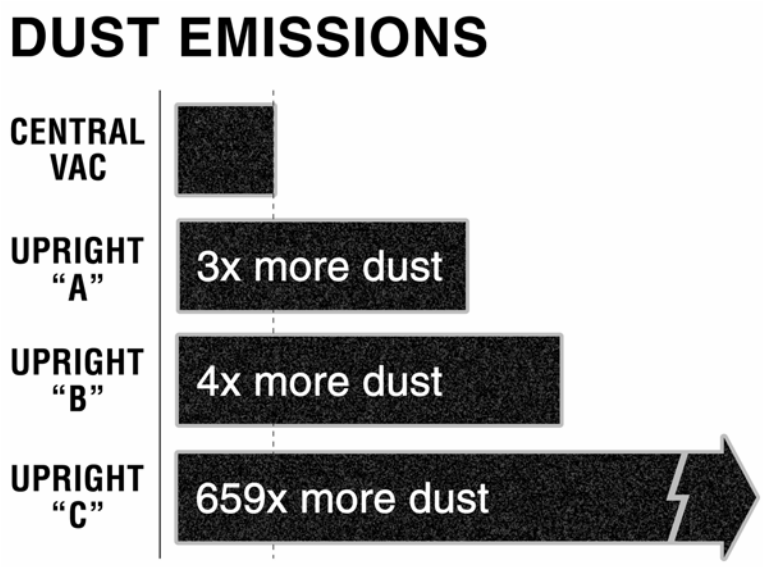
For the estimated 42.6 million Americans who suffer from hay fever, asthma or both, removing indoor allergens is critically important to relieve symptoms and reduce the risk of serious health complications.

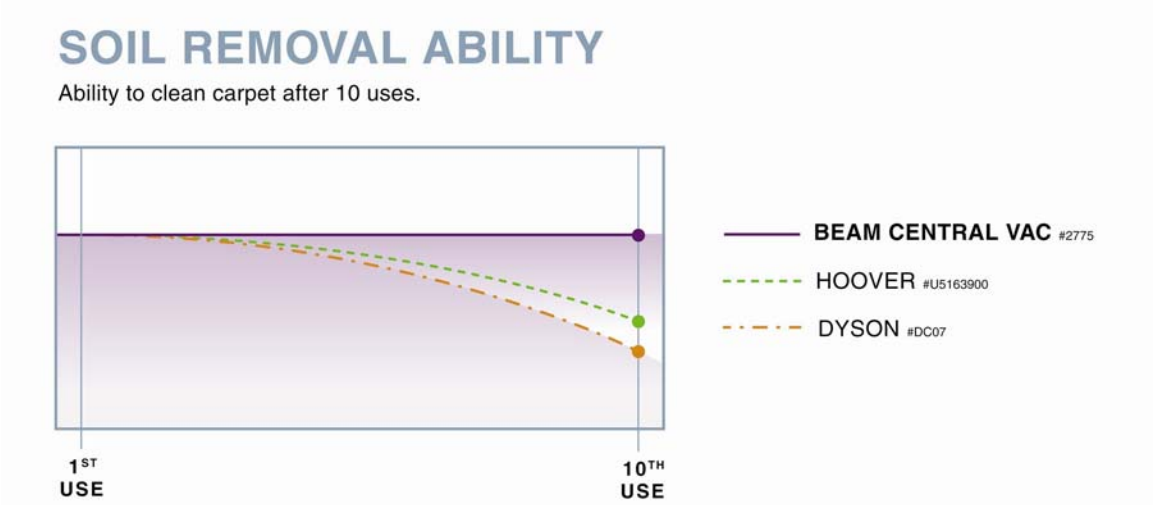
Electrolux Central Vacuum Systems, formerly Beam Industries (www.beam.com), had received numerous anecdotal accounts from customers whose allergy symptoms dramatically improved when they switched from a conventional vacuum to a central vacuum system for cleaning their homes. In 2001, the company collaborated with the Division of Allergy and Immunology at the University of California, Davis, School of Medicine in a first-of-its-kind clinical study of hay fever patients. Patients in the double-blind study recorded their symptoms each week for six months, including three months during which they used a Beam Central Vacuum System and three months when they used a conventional vacuum to clean their homes.

The study found that when patients used the central vacuum system they reported:

- 44 percent improvement in sleep-related symptoms
- 47 percent improvement in nasal symptoms
- 48 percent improvement in non-nasal symptoms
- 61 percent improvement in eye symptoms
- 58 percent improvement in emotional symptoms
- 52 percent reduction in practical problems; and
- 46 percent less negative impacts on normal daily work or leisure activity.

To further validate the IAQ benefits of a central vacuum system Beam commissioned a second study that compared long term soil-removal and particulate emission control of central vacuums with top-selling, HEPA filter-equipped upright vacuums. The study found that the central vacuums maintained consistent soil removal and emission control while uprights either lost soil removal capability or significantly increased emissions over time.





IAQ Particulate Test -- ProfessionalTesting Laboratory, Dalton, GA

Central Vacs and Green Building

Since the UC-Davis study results were published in 2002 a variety of leading healthy home demonstration programs and green building organizations around U.S. modified their guidelines to encourage installation of central vacuum systems. These programs included the American Lung Association® HealthHouse® (www.healthhouse.org) Program and the Florida Energy Extension Service. Voluntary green building programs such as Built Green® Colorado (www.builtgreen.org), EarthCraft House™ (www.earthcrafthouse.org) and the U.S. Green Building Council's LEED® for Homes (www.usgbc.org) Program assigned points for central vacuums in homes that would count toward green certification. In 2008, the National Association of Homebuilders (www.nahb.org) is slated to adopt the first National Green Building Standards that will award five points for any new home that includes a central vacuum system vented to the outdoors.

Ron Jones, owner of Sierra Custom Builders and a member of the steering committees that developed both the LEED for Homes and NAHB Green Building Standards, says central vacuum systems have long been standard equipment in his custom homes.

“They stopped being an option for us years ago,” he said. “We want all of our customers to benefit from the improved indoor air quality, superior cleaning and convenience that results from using a properly designed and installed central vacuum system.”

Adding to the appeal of a central vacuum system is the fact that it is an indoor environmental quality enhancement that the home buyer uses regularly and a product that can add as much or more value to the home than what it costs. Moreover, the National Association of Realtors (www.realtor.org) has stated that a home equipped with a built-in central vacuum typically sells faster than a comparable home without one.

The green benefits of central vacuum systems extend beyond their indoor air quality contributions. Although a central vacuum system is up to five times more powerful than a portable vacuum, the amount of energy required to run it is almost the same. The largest selling central vacuum power unit, the Beam Serenity® QS™ Model 375, operating one hour per week would consume 90.48 kilowatt hours of electricity at a cost of approximately $6.78 annually. That is less than one-half the energy required to run a typical personal computer or clothes washer and one-sixth the energy that would be required to operate a refrigerator for an entire year.

Additionally, central vacuum systems cause less strain on the waste stream than conventional vacuum cleaners. A study conducted for Appliance magazine’s 30th Annual Portrait of the U.S. Appliance Industry published in September 2007 estimated the average life expectancy of a central vacuum system to be 15 years, compared with an average life expectancy of six years for an upright or canister vacuum. The same study estimated that more than 17.7 million conventional vacuum systems will need to be replaced in 2008, with most ending up in landfills, compared with 141,000 central vacuum systems that would need replacing in 2008.

For all these factors, indoor air quality, efficient energy use and waste reduction, central vacuum systems offer an important step toward a healthier living and a more sustainable environment.

For more information on central vacuum systems and green building go to www.beam.com/builder.

About the Author

Stephen R. Klossner, president and owner of Advanced Certified Thermography in Lakeland, Minnesota, has over 25 years of experience in the indoor air quality and home diagnostics field. Klossner participates in ongoing indoor air quality research and has developed residential and commercial performance standards on local and national levels. Klossner is co-author of the National Health House performance standards and building criteria and serves as a consultant to The American Lung Association's National Health House Program and the Energy & Environmental Building Association (EEBA).

About EEBA

Since 1982, the Energy & Environmental Building Association (EEBA) has dedicated its work to the development and distribution of best practice building performance education. Through the Houses That Work educational series, Excellence in Building Conference and building science publications, EEBA is improving the knowledge base of the building industry and changing the way homes are built. For more information visit the EEBA website at www.eeba.org.