Creating a green & sustainable garage: Make the garage environmentally friendly by sealing, insulating and more.

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Make the garage environmentally friendly by sealing, insulating and more.
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Although the garage is not necessarily a focal point when building a house, deciding to remodel it in a green fashion can improve air quality and energy efficiency, and preserve our water supply. It will also cut down on heating and cooling costs, partly by separating heated and unheated spaces.

Keeping warm

To reduce a household's energy bill and usage, first determine whether or not the garage has a seal. Use a blower door with a manometer to measure the difference between air pressures in the house and in the garage, says Doug Horgan, owner and customer service manager at BOWA Builders, Inc., in McLean, Va.. "The key thing is to get a building energy analysis," Horgan says. A building energy analyst can assess the amount of leakage between the garage and the house, and how to reduce the number of leaks. To find a qualified energy auditor, consult your local, state or national government energy or weatherization office, Residential Energy Services Network, National Association of Energy Service Companies or the ENERGY STAR program.

If a careful analysis proves that the house is not well-sealed, homeowners can fix that by adding weather stripping between the garage and any living spaces, including walls and, if applicable, the ceiling. If a home has an attic above the garage with an access door leading down to the car storage area, adding weather stripping around the door will help provide an effective seal. Many times a set of stairs folds-down from the attic through the door. "[However,] even if the access door to the garage [from the house] is well-sealed today, weather stripping might wear out," Horgan notes. Check it every two to three years, he says.

A potential problem with sealing the garage concerns whether the ductwork is straight. If it is not, then homeowners should pay careful attention to the turns in it. "It's very important to make sure joints in the ductwork are well-sealed," Horgan says. This is to prevent pollutants from the garage from moving into the whole house's heating and air-conditioning systems, and traveling throughout the house.

After sealing the garage, insulate it. Sufficient insulation is necessary throughout the entire house, including the garage. "A good, solid blanket of [any] insulation [will suffice]," J. Byron Kellar, design builder for Neil Kelly Design/Build Remodeling says. However, some remodelers note variations among different types of insulation, and advocate for specific options. For more on the insulation debate, see link.

Homeowners should note, though, that insulation is only part of the equation. "You can spend money insulating, but if you don't have a good seal … then much of what you've spent has been wasted," Kellar says.

Choose wisely

Although attached garages provide the most convenience, they also potentially let CO into the house from the garage. If the garage is detached from the house, or even connected only by a breezeway, this problem is eliminated. A breezeway links two structures, and generally has a roof and may or may not have walls.

One way to monitor the amount of CO in the house and in the garage is to keep a CO detector in the hall next to the garage, Alex Dean, CR, president of The Alexander Group, Inc., in Kensington, Md., says.

In addition to the exhaust fumes that cars regularly discharge into the garage, many residents store chemicals there, including paints, pesticides, herbicides, solvents and gas cans, says Tim Cook, owner of ENVI Construction, LLC, in Portland, Ore. "[These] can be sucked into the house through changes in air pressure, contaminating the air of the home," he says. "Chemicals mix with the air because of draft[s]."

Dean suggests installing an exhaust fan directed to the outdoors that switches on immediately when residents open the garage door. "[This will] blow the exhaust out of the garage," Horgan says.

Because of this, homeowners should carefully choose which chemicals to store in the garage. To determine the conditions in which to keep them, do the obvious and first read the labels, Kellar says. These contain recommendations, including the correct temperatures. If you must store chemicals in the garage, Cook suggests purchasing a container solely for them or using an airtight locker. Use a cabinet or closet with vents and a lock for assurance, with the major goal of maintaining clean indoor air, Kellar says.

One way to cut down on potential difficulties with chemicals is to seal the garage, and to use caulking, adhesives, stains, paints and cleaners that are biodegradable and contain few, if any VOCs. Instead, Dean recommends non-shrinking and flexible adhesives to seal all air gaps between materials. These will produce almost no toxic odors.

Appliances

Although they are not necessarily the first elements to come to mind when considering green remodeling of the garage, some appliances are kept in the garage. If a home's heating system and hot water heater are kept in the garage, homeowners should insulate them, Kellar says. If the manufacturer recommends wrapping the hot water heater in a jacket, this will cut costs. If not, homeowners are still likely to find other ways to cut costs and help preserve the environment. In addition, if residents store water pipes in the garage, then they should insulate them.

"There is no best way to do something. [Things should be] done on a case-by-case basis," Kellar says. Homeowners should increase their knowledge of green remodeling by working with their utilities' in-house professional consultants or auditors. "[They] advise residential and commercial customers on ways to retrofit their homes or businesses in order to reduce energy costs. They might recommend new high-efficiency windows, additional insulation and weather-stripping or more efficient furnaces and appliances, which often come with utility-sponsored rebates, incentives, [and] sometimes state and federal tax credits or deductions," Kellar says.

Certain programs, including Energy Star, certify homes and products, inform consumers of the greenest options for their residences, and offer directories of engineers and other professionals who can help improve the energy efficiency of buildings. These individuals analyze the length of time it would take to offset the cost of a device and its installation by paying energy bills lower than those received because of purchasing a less expensive, but also less efficient alternative. Individuals should determine what to purchase based-on what makes sense for them. For instance, a homeowner might have to choose between purchasing an efficient hot-water system for $5,000 or a less-efficient system for $1,000. It might take 20 or more years to pay back the cost of the first one, while the amount of time it would take for the latter would obviously be shorter.

Although residents might expect that professionals would all recommend buying the more efficient, more expensive item, Kellar makes a counter argument supporting the second option. "If residents invest the $4,000 difference in insulation or windows, they might save a lot more over the years and be more comfortable," he says. "The reality is that most people have budgets."

Homeowners must balance the expense with environmental friendliness in a combination that works well for them.

Don't forget the driveway

In addition to modifying sealing and insulation, another element to note when remodeling the garage is the driveway leading up to it. The U.S. Environmental Protection Agency recommends using pervious concrete as one of its Best Management Practices. In addition, other agencies and geotechnical engineers in the United States also suggest utilizing this type of concrete as one means of onsite storm water management. By acting as a natural infiltrator, porous concrete reduces the usage and waste of water. When water falls off the roof or the driveway, this type of concrete absorbs it, and the water travels through it and into the grass. This water then eventually becomes rainwater, rather than liquid that municipalities must treat before residents can safely consume it. Other names for pervious concrete include permeable, porous, enhanced-porosity, no-fines, and gap-graded concrete.

Another environmentally friendly option for the driveway is using square pieces of concrete with turf that fills in gaps between them. One alternative places recycled plastic in sand and gravel. Both of these possibilities offer better drainage than traditional concrete driveways do, saving precious resources.

Whether re-doing the driveway, trying to keep chemicals out of the house or purchasing the most energy-efficient appliances, homeowners should choose the solutions that work best for them. In this way, they will put their own unique imprints on the green remodeling movement.