

Materials Stored in Your Garage Contribute to Poor Indoor Air Quality

Imagine this scenario: You just received your Home Air Check™ report; your total VOC (Volatile Organic Compound) value is higher than you anticipated; and the overall Air Quality level is “Elevated.” You scan down the list of Contamination Index™ categories and discover that the categories listed as “Gasoline,” “Light Solvents,” and “Adhesives-Toluene Based” are all labeled with a Severity Index of Moderate or Elevated. You wonder how this can be possible. There aren’t any materials stored within your home that could yield VOCs from these categories, so you are puzzled as to why they appear in your report. Now for the reality: **Most people involved in this scenario have a garage attached to their home, and don’t fully realize the implications of how the contents stored in their garage are contributing to the overall indoor air quality in their home.** This bulletin explores the typical sources of VOCs in your garage and how you can reduce the overall contribution of VOCs from these sources, leading to improved indoor air quality and improved health.

Fuels and gasoline, lawn equipment, automotive products, glues and adhesives, solvents, stored paints and chemicals, and hobby supplies are the typical materials stored in garages. A research group at the University of Michigan performed a study on the migration of volatile organic compounds from attached garages in 15 single-family homes [1]. A total of 39 VOCs were detected indoors, 36 VOCs were detected in the garage, and 20 VOCs were detected in ambient air. Airflows and source partitioning (garage vs. indoor) were studied using tracer gases. As an example, ratios of volatiles detected in the garage and in the home and multi-zone IAQ (indoor air quality) models showed that nearly all of the benzene and most of the fuel-related aromatics detected in the homes resulted from migration from garage sources. Vehicle exhaust is the other major contributing source of VOCs in the garage. A 1997 OSHA study of homes in Minnesota showed that nearly 70% of carbon monoxide related IAQ issues were caused by migration of carbon monoxide from the garage [2].

What steps can you take to reduce the migration of volatile organic compounds from the garage to your home? The most effective way is to keep the garage air as “clean” as possible. Consider building an outdoor shed for storage of outdoor power equipment (lawnmowers, weed trimmers, recreational vehicles, etc.) and solvents. This would especially be useful in the summer months, where warmer temperatures result in higher solvent vapor pressures, thereby elevating the levels of VOCs in the garage. If solvent containers are stored in the garage, ensure that the lids are sealed tightly. Lastly, do not allow vehicles to warm up in the garage or idle for any significant length of time.

Some people spend considerable time working in the garage on hobbies, automobiles, or other projects involving the use of solvent-based chemicals. Clothing can absorb/adsorb VOCs from the garage environment. Do not wear the same clothing in the house that is worn when working in the garage. Remove the affected clothing and seal it in a plastic bag until it can be laundered.

Finally, you can minimize the migration of VOCs from the garage by ensuring that the garage walls and ceilings are finished [2], that the entry door to the home is properly sealed, and most importantly, that the entry door to the home is kept closed as much as possible.

About Prism Analytical Technologies, Inc.

Prism Analytical Technologies, Inc. is a leading consultative air testing laboratory in the United States that is devoted to the chemical identification and analysis of contaminants in the air. We are a recognized leader in the development and deployment of ambient air testing methodologies for Fortune 100 and 500 companies, industrial hygienists, and environmental consultants. Prism's science-based technologies and wide range of air testing support help clients solve indoor air quality, process control, industrial, and environmental challenges.

After taking measures to reduce the impact of garage VOCs in your home, we highly recommend performing a follow-up Home Air Check test to verify your indoor air quality improvements. A path of continuous improvement in air quality will lead to cleaner, healthier air for you and your family.

[1] Batterman, S.; Jia, C.; Hatzivasilis, G. Environmental Research, 104 (2007), 224-240.

[2] About.com; http://garages.about.com/od/buildingagarage/a/garages_and_indoor_air_quality.htm, "Stop Garage Fumes From Polluting Indoor Air", Jeff Beneke (2012).

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