

Client Contact: Anne Smith 1234 Maple Street

Chicago, Illinois 60606

Sampling Professional:

John North Western Inspectors Sample Volume (L): 18.0

> Sample Type: TDT 150B

Sample Condition: Not Described Receive Date: 08/24/2020

Approve Date: 08/24/2020

Scan Date: 08/24/2020 Report Date: 08/26/2020

Sampled Date: 08/19/2020

Client Sample ID:

Report Number: 6009-1

HELPING BUILDINGS GET HEALTHY FOR YOUR WELL BEING

WellBuild Lab test kits is a trusted tool that could reveal possible contaminants interfering with your air quality that might be harmful to you in your home, a home you're thinking of buying, or your work space. A healthy environment will make your commitment to living a healthy lifestyle more of a reality. Formaldehyde, VOC's, and mold are a few of the common things that contaminate the buildings that we live and work in. These can all lead to illnesses and major health issues that prevent our bodies from thriving. These kits are easy to use and connect you with a professional to guide you and give you the specific resources, recommendations, and products you might need.

WellBuild Lab technology and support along with professional lab services from Prism Analytical are one of the most advanced, trusted air testing products on the market today for identifying chemical sources and active mold growth in a home. Many indoor air quality (IAQ) issues identified by WellBuild Lab can be easily remediated or eliminated. This test is an invaluable tool for:

- managers, landlords, employers, inspectors
- experience allergy, asthma, chemical sensitivities, or immunocompromised individuals
- want to monitor for dangerous levels as indoor air quality changes from season to season
- travel for work and want peace of mind by testing short term living spaces
- extensive remodel testing pre and post will help to understand the impact on your IAQ
- need a detailed report to go over with health and wellness expert

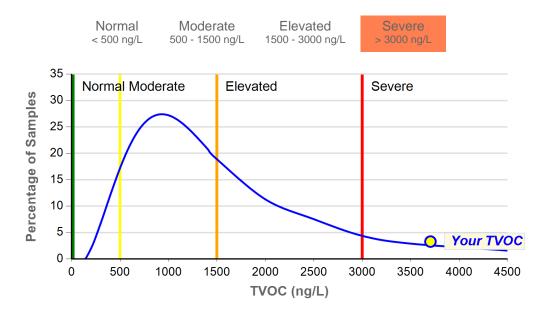
WellBuild lab provides important information on potential contamination issues in the home that cannot be detected by a visual inspection alone. Many chemicals can off gas for up to 15 years or more. Acting upon the information in this report from Prism Analytical as well as consulting with DesignWell Studios, will enable you to dramatically improve the air quality in your home, creating a healthier environment for you and your family.



VOLATILE ORGANIC COMPOUNDS (VOCS)

Volatile Organic Compounds, or VOCs, are chemicals, or chemical combinations we don't want to be present in our indoor environment. Recent studies (and your own experience) tell us that we spend most of our time indoors, about 90%. The EPA tells us that indoor air can have 100 times the chemicals that outdoor air has. All the more reason to test the air you are breathing here with WellBuild Lab.





TOTAL VOLATILE CHEMICAL (TVOC) CHART

The chart above shows the TVOC levels for all homes tested using WellBuild Lab. Results for this air sample are displayed on the chart as a yellow circle. The blue curved line represents the relationship between the percentage of homes (indicated on the vertical y-axis) and the TVOC level (indicated on the horizontal x-axis). The green, yellow, orange, and red vertical bars represent divisions between Normal, Moderate, Elevated, and Severe TVOC levels. As the TVOC value increases, individuals may experience aggravated health problems, and therefore, the need to address VOC issues becomes more critical. However, reductions in VOCs can be made at any level.

STANDARDS

The U.S. federal government has not specified a TVOC limit for indoor air. However, the U.S. Green Building Council (USGBC) has recommended 500 ng/L as the upper TVOC limit. TVOC levels below 500 ng/L indicate that the IAQ is acceptable for most individuals; however, chemically sensitive persons may require lower levels. TVOC levels between 500 and 1,500 ng/L indicate that the air quality is marginal and some effect on the occupants is possible. Levels above 1,500 ng/L indicate that your IAQ should definitely be improved. These levels are based on observed health effects and have been determined from a combination of published journal articles (1, 2, 3) and the statistical distribution of TVOC concentrations from the WellBuild Lab methodology. For more information on Precautionary Principle click here. (designwell studios blog post about precautionary principle)

HEALTH ISSUES RELATED TO VOCS

The presence of chemicals in your home can cause a wide range of problems, ranging from an unpleasant odor to physical symptoms (burning and irritation in the eyes, nose, and throat; headaches; nausea; nervous system effects; severe illness; etc.). Anyone with respiratory issues like asthma and allergies, as well as children, the elderly, and pregnant women are more susceptible to poor indoor air quality than healthy individuals. However, at higher TVOC levels even healthy individuals are likely to experience ill effects. For more information on environmental health issues click here (link to DesignWell Studios Health Page).



SOURCES

Building materials:

- Paint, paint strippers
- Varnishes and finishes
- Caulks and sealants
- Adhesives
- Flooring, carpet, pressed wood products

Home & personal care products:

- Cleaners and disinfectants
- Furniture
- Pesticides
- Air fresheners
- Cosmetics and deodorants
- Fuel oil, gasoline

Activities:

- Tobacco smoke
- Dry-cleaned clothing
- Arts and crafts products; glues, permanent markers, etc.
- Wood burning stoves
- Office printers and copiers

Outdoor Sources

- Gasoline
- Diesel emissions
- Wood burning
- Oil and gas extraction and processing
- Industrial emissions



Contamination Index™

The Contamination Index™ (CI) shows the types of air-contaminating products and materials that are present in your home. Each CI category shows the approximate contribution of that category to the TVOC level, indicates how your home compares to thousands of other homes, and provides some suggestions for where these products and materials might be found. The CI is divided into three main source groups: Building-Related Sources, Mixed Building and Lifestyle Sources, and Lifestyle Sources.

- Building-Related Sources are those that are typically part of the structure of the home and may be more difficult to
 reduce in the short term. Recent construction or renovation often increases the CI categories in this group to the
 Elevated, High, or Severe levels. VOCs from these activities often decrease substantially in the month following
 use/application of these products, especially if the area is flushed with air to dissipate the VOCs off gassed from the
 new products or materials.
- Mixed Building and Lifestyle Sources are those that could belong to either category and investigation on your part
 may be necessary to determine which source is more likely. Recent construction or renovation can often contribute
 to other source categories in addition to Building-Related Sources.
- Lifestyle Sources are those that the occupants of the home bring into the home and can usually be readily identified and remediated. Recent construction or renovation can often contribute to other source categories in addition to Building-Related Sources.

It is possible for a category listed in one source group to belong to another source group. For example, the Coatings' category is in the Building source group because the largest contribution is typically the paint on the walls, but cans of paint stored in a basement or garage could be considered part of the Lifestyle sources group. Always consider all possible sources for a particular CI category.

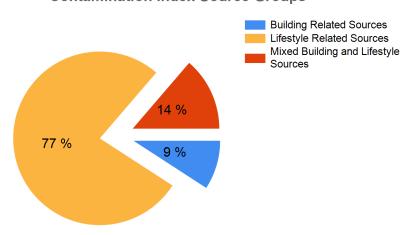
The CI classifications begin at Normal and progress through Moderate, Elevated, High and Severe. These severity classifications are determined using a combination of statistical data gathered from thousands of samples and health information specific to each CI category.

Since there are potentially many sources of VOCs, homes can often be re-contaminated even after sources have been removed because new products are constantly being brought into the home. Home occupants and homebuyers should take note of this fact, and view IAQ as a continuous improvement process.

The chart below depicts the distribution of the Contamination Index source groups.

Note: These source groups are estimates and may not indicate all of the VOCs in your air sample.

Contamination Index Source Groups





Contamination Index™ Building Sources

Use the Contamination Index (CI) below to help you find products in your home that may be affecting your indoor air quality. Removing or reducing these products will improve your air quality. The concentrations reported here are approximate and may not add up to the TVOC value on page 2 of this report. These categories are typically part of the structure of the home and may be more difficult to reduce in the short term. Recent construction or renovation will often cause these categories to be elevated. The CI classifications begin at Normal and progress through Moderate, Elevated, High and Severe. These severity classifications are determined using a combination of statistical data gathered from thousands of samples and health information specific to each CI category. Levels indicated as Elevated, High, or Severe should be immediately addressed, and those listed as Moderate are areas that can be improved over time.

Contamination Index Category	VOC Level (ng/L)	Severity	Description and Suggestions for VOC Reduction	
Coatings (Paints, Varnishes, etc.)	490	Moderate	Includes interior and exterior paints (including low- or no-VOC paints), varnishes, lacquers, some sealants, and other products that can be classified as a coating over a surface. Typically, VOCs from these products are in the 10 to 14 carbon size range and can linger for several months, sometimes longer. Ventilate as much as possible during and after application of these products and dispose of opened but unused products and related supplies if possible or store in areas that will minimize off gassing. There is some overlap between chemical compounds associated with 'Coatings (Paints, Varnishes, etc.)' and those found in 'Fuel Oil, Diesel Fuel, Kerosene.'	
PVC Cement	2	Normal	PVC cement is used to join pieces of PVC pipe together, usually for plumbing.	
HFCs and CFCs (FreonsTM)	2	Normal	Most often used as refrigerants for air conditioners and refrigerator/freezers and propellants for blown-in insulation, cust aerosol cans, etc. Many of these chemical compounds are being phased out because of the Montreal Protocol.	

Building Related Sources



Contamination Index™ Mixed Building and Lifestyle Sources

Use the Contamination Index (CI) below to help you find products in your home that may be affecting your indoor air quality. Removing or reducing these products will improve your air quality. The concentrations reported here are approximate and may not add up to the TVOC value on page 2 of this report. These categories could belong to either the Building or Lifestyle groups so additional investigation may be necessary to determine which source is more likely. The CI classifications begin at Normal and progress through Moderate, Elevated, High and Severe. These severity classifications are determined using a combination of statistical data gathered from thousands of samples and health information specific to each CI category. Levels indicated as Elevated, High, or Severe should be immediately addressed, and those listed as Moderate are areas that can be improved over time.

Ectimated

Contamination Index Category	VOC Level (ng/L)	Severity	Description and Suggestions for VOC Reduction
Building Materials-Toluene Based	0	Normal	Adhesives and glues used in construction and maintenance, arts and crafts; adhesive removers; contact cement; sealants; coatings (paint, polyurethane, lacquer, thinner); automotive products, including parts cleaners. Additional sources include gasoline and other fuels.
Gasoline	83	Normal	VOCs from gasoline are typically a result of off-gassing from gas containers and gas-powered equipment such as lawnmowers, snow blowers, mini-bikes, etc. that are stored in attached garages or basements. Does not include exhaust emissions. These items should be stored externally to the home. Additionally, gasoline VOCs can linger on clothing after refueling an automobile at a gas station. Gasoline includes chemical compounds that are also included in the 'Light Solvents' category.
Fuel Oil, Diesel Fuel, Kerosene	0	Normal	Often found in garages and basements. These fuels are not very volatile so will not readily get into the air, but they can linger for a long time and produce a strong, unpleasant odor. Does not include exhaust emissions. There is some overlap between chemical compounds associated with 'Fuel Oil, Diesel Fuel, Kerosene' and those found in 'Coatings (Paints, Varnishes, etc.).'
Moth Balls (Naphthalene Based)	0	Normal	Napthalene based moth balls. May be present with p- Dichlorobenzene-based moth crystals.
Moth Crystals (p-Dichlorobenzene Based)	1	Normal	p-Dichlorobenzene based moth crystals. May be present with Naphthalene-based moth balls.
Light Hydrocarbons	590	Moderate	Building materials; aerosol cans; fuel for cooking/camping/lighters; LPG; refrigerant; natural gas; propellant; blowing agent. Includes chemical compounds such as propane, butane, and isobutane.
Light Solvents	62	Normal	Stoddard solvent; mineral spirits; some coatings (paints, varnish, enamels); wax remover; adhesives; automotive products; light oils. Typically, VOCs from these products are in the 6 to 9 carbon size range.
Methylene Chloride	0	Normal	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide.



Contamination Index™ Lifestyle Sources

Use the Contamination Index (CI) below to help you find products in your home that may be affecting your indoor air quality. Removing or reducing these products will improve your air quality. The concentrations reported here are approximate and may not add up to the TVOC value on page 2 of this report. These categories are typically brought into the home by the occupants and can often be readily identified and removed or contained. The CI classifications begin at Normal and progress through Moderate, Elevated, High and Severe. These severity classifications are determined using a combination of statistical data gathered from thousands of samples and health information specific to each CI category. Levels indicated as Elevated, High, or Severe should be immediately addressed, and those listed as Moderate are areas that can be improved over time.

Estimated

Contamination Index Category	VOC Level (ng/L)	Severity	Description and Suggestions for VOC Reduction
Personal Care Products	1500	High	Soap, deodorant, lotions, perfumes, hair coloring supplies, nail care supplies, oral hygiene products, etc. These products contain many VOCs that will dissipate if use is discontinued or reduced. Consider storing these products in a closed container when not in use, and dispose of unused products. Also, run an exhaust fan or open a window when using these products. Some chemical compounds associated with this category can also be found in cleaning products and building materials, consider recent cleaning or renovations/construction as possible sources.
Alcohol Products	2500	High	Household cleaning products, antiseptic wipes, hand sanitizers, some solvents, reed diffusers, consumable alcohol, and some pharmaceuticals. These concentrations will be reduced by removing unnecessary products or proper storage of those materials in closed airtight containers. Promptly rinse empty alcoholic beverage containers and place outside if possible. Consolidate cleaning products to the essentials. Consider switching to alternative methods of cleaning and sanitizing, e.g., baking soda, vinegar, borax, steam, etc., and ventilate the area during and after cleaning. Alcohol can also be found in some building materials, consider recent renovations/construction as a possible source.
Odorants and Fragrances	68	Normal	VOCs in this cateogry can be found in scented candles, potpourri, air fresheners, scented cleaning products, and scented personal care products. Consider reducing use of scented products and store unused products in a tight fitting container.
Dry Cleaning Solvents	0	Normal	Typical dry-cleaning methods employ the use of carcinogenic chemicals. Dry-cleaning should be allowed to vent outside, without plastics bags, before being placed inside.
Medicinals	2	Normal	Ointments and creams, topical first aid/pain relievers.



Significant VOCs

Based upon your specific home air analysis, the chemical compounds listed below are significant contributors to the TVOC level reported on page 2 of your WellBuild Lab Report or are indicative of specific types of products or problems. Compounds from a variety of chemical classes are represented here, although only the most common or most notable are specifically listed. These chemical compounds may come from a variety of sources as shown in the Contamination Index section of this report.

The Chemical Abstracts Service (CAS) registry number after the chemical compound name in the table below is a unique identifier for that chemical compound and is often the best means to search for additional information. The two VOC levels in the table below (ng/L and ppb) are different ways of describing the same concentration, in some cases exposure limits or other information may be described using one or both of these concentration units.

Compound	CAS	Estimated VOC Level (ng/L)	Estimated VOC Level (ppb)	Description
Ethanol	64-17-5	2500	1300	Cleaners, especially antiseptic wipes; personal care; consumable alcohol; some solvents; renewable gasoline component; pharmaceuticals
Butane (C 4)	106-97-8	570	240	Aerosol propellant; cooking/camping/lighters fluids; liquefied petroleum gas (LPG); refrigerant; food additive
Isopropanol	67-63-0	190	77	Rubbing alcohol; cleaners, especially antiseptic wipes; personal care; solvents; food and beverages; microbial biocides or antimicrobial agents
Acetone	67-64-1	53	22	Personal care, especially nail care; cleaners; paints and coatings; strippers and thinners; PVC cleaner; caulks and adhesives; wood filler; solvent
Limonene	138-86-3 or 5989-27-5	30	5	Limonene (CAS 138-86-3) or d-Limonene (CAS 5989-27-5)Fragrances; paints and coatings; cleaners; solvent; preservative
Hexanal	66-25-1	20	5	Fragrances; food additive; solvent
Texanol-B	74367-34-3	18	2	Paints and coatings, typically latex paint; glue and adhesive; sealer
Ethylacetate	141-78-6	10	3	Solvent; some paints and coatings, especially automotive paint; automotive fabric protector; pesticides; personal care, especially nail care; flavor additive
Chloroform	67-66-3	10	2	Adhesive removers; some automotive products; paints and coatings; byproduct of water treatment; formerly used as anesthetic



EPA Hazardous Air Pollutants (HAPs)

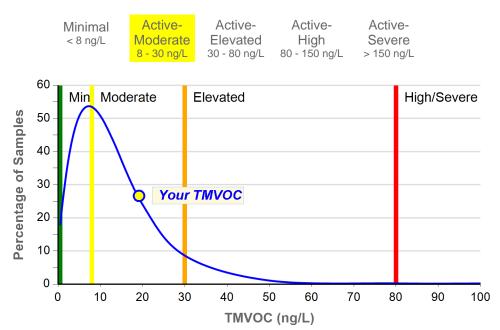
Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Listed below are those HAPs that are included with the WellBuild Lab VOC test, this list does not include all HAPs. The '<' (less than) symbol in the 'Estimated VOC Level' columns indicates that compound is below the reporting limit for this air sample. For more information about HAPs visit the EPA <u>Air Toxics website</u>. The exposure limits listed below can also be found in the <u>NIOSH Guide to Chemical Hazards</u>. The HAPs in the table below may also be listed as Significant VOCs if the concentration of that chemical compound is greater than the threshold level for a Significant VOC.

Compound	CAS	Estimated VOC Level (ng/L)	Estimated VOC Level (ppb)	NIOSH Exposure Limit	Description
Carbonyl sulfide	463-58-1	< 1	< 0.4	None Listed	Fumigant; contaminated drywall; fuel combustion byproduct; some foods; naturally occurring at low levels
Carbon Disulfide	75-15-0	< 1	< 0.3	3,000 ng/L (1,000 ppb)	Solvent; fumigant; contaminated drywall; combustion byproduct
Methylene Chloride	75-09-2	< 1	< 0.3	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Hexane (C 6)	110-54-3	< 1	< 0.3	180,000 ng/L (50,000 ppb)	Solvent; adhesive; grease; lubricant; paints and coatings; petroleum fuel component
1,1,1-Trichloroethane	71-55-6	< 1	< 0.2	C; 1,900,000 ng/L (350,000 ppb)	Adhesives, lubricants, cleaners, solvents
Benzene	71-43-2	< 1	< 0.3	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
1,2-Dichloroethane	107-06-2	2	0.4	Carcinogen; 4,000 ng/L (1,000 ppb)	PVC production; solvent for rubber, insecticides, oils, waxes, gums, resins; rug and upholstery cleaners
Trichloroethene	79-01-6	< 1	< 0.2	Carcinogen	Dry cleaning; degreasers and cleaners for home/automotive; varnish removers; anesthetic
Methyl methacrylate	80-62-6	< 1	< 0.3	410,000 ng/L (100,000 ppb)	Acrylic Polymers for paints and coatings, adhesives, fillers; solvent; pharmaceuticals; personal care
Toluene	108-88-3	3	0.7	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
Tetrachloroethene	127-18-4	< 1	< 0.1	Carcinogen	Dry cleaning; adhesives, automotive cleaners, polishes
Ethylbenzene	100-41-4	2	0.5	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; solvent; pesticide
m,p-Xylene	108-38-3; 106-42-3	8	2	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	3	0.6	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
Styrene	100-42-5	1	0.3	215,000 ng/L (50,000 ppb)	Polystyrene foam; synthetic rubber; flavoring agent
1,4-Dichlorobenzene	106-46-7	1	0.2	Carcinogen	Moth balls/crystals; room deodorant
Naphthalene	91-20-3	< 1	< 0.2	50,000 ng/L (10,000 ppb)	Gasoline; diesel; Moth balls/crystals; insecticide



Total Mold Volatile Organic Compounds (TMVOC)





MVOC Interpretation

As described above, the TMVOC value is an assessment of the quantity of actively growing mold in your home. Like TVOC, no government unit or organization has specified limits for TMVOC. This is why we adhere to the precautionary principle. The levels below describe the effects individuals exposed to these TMVOC values may experience. These levels are qualitative estimates of possible effects experienced by healthy individuals. Sensitive individuals or those with chronic or respiratory issues may experience effects at much lower levels. Mold may be visible on a surface but in an inactive state resulting in little or no production of MVOCs. Regardless of the TMVOC result if mold is visible it should be removed since molds may still produce spores or mycotoxins in an inactive state and new exposure to water or moisture can initiate new mold growth. Consult with a professional to mitigate properly. Since MVOCs are VOCs, they can be affected by the same environmental conditions that affect other VOCs. Primarily lower temperature and higher air flow or ventilation will reduce MVOC concentrations. Any water or moisture issues should be addressed quickly to limit the potential for mold growth.

These levels were determined empirically through interaction with air quality professionals regarding the reported health effects experienced by individuals exposed to actively growing mold. This test does not indicate specific spores or the amount. If your TMVOC is elevated it is recommended to test further for specific spores present in the air or on a surface.

Go to designwellstudios.com to get more information about our MOLD TESTING PUMPS.

These results are authorized by the Laboratory Director or approved representative.



Thank you for choosing WellBuild Lab.

Your report will be emailed to you within 5-7 business days. An environmental wellness expert will email the report to you and go over it with you at a scheduled time.

If you have any questions please call 503.386.2003 or email info@designwellstudios.com.



This analysis was performed by Prism Analytical Technologies (Prism).

The results contained in this report are dependent upon a number of factors over which Prism has no control, which may include, but are not limited to, the sampling technique utilized, the size or source of sample, the ability of the sampler to collect a proper or suitable sample, the compounds which make up the TVOC, and/or the type of mold(s) present. Therefore, the opinions contained in this report may be invalid and cannot be considered or construed as definitive and neither Prism, nor its agents, officers, directors, employees, or successors shall be liable for any claims, actions, causes of action, costs, loss of service, medical or other expenses or any compensation whatsoever which may now or hereafter occur or accrue based upon the information or opinions contained herein.

LINKS

US EPA Indoor Air Quality (IAQ)

American Lung Association Healthy Air at Home

World Health Organization (WHO) Guidelines for Indoor Air Quality

Lawrence Berkeley National Laboratory Indoor Volatile Organic Compounds (VOCs) and Health

World Health Organization (WHO):

WHO Guidelines for Indoor Air Quality - Dampness and Mold

US Environmental Protection Agency (EPA):

Molds and Moisture

A Brief Guide to Mold, Moisture, and your Home

American Industrial Hygiene Association (AIHA)

Position Statement on Mold and Dampness

American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE):

Limiting Indoor Mold and Dampness in Buildings

(Position Documents; click on Limiting Indoor Mold and Dampness in Buildings)

REFERENCES

- 1 L. Molhave, Volatile Organic Compounds, Indoor Air Quality and Health, Vol. 5, International Indoor Air Quality Conference, Toronto, Canada, 1990, p. 22 ff.
- 2 European Collaborative Action: Indoor Air Quality and its Impact on Man (ECA-IAQ), Report No 19 Total Volatile Organic Compounds (TVOC) in Indoor Air Quality Investigations, 1997. (from L. Molhave et al., Total Volatile Organic Compound (TVOC) in Indoor Air Quality Investigation, Indoor Air 1997; 225-240.)
- 3 T. Salthammer, Critical evaluation of approaches in setting indoor air quality guidelines and reference values, Chemosphere 82, 2011, 1507-1517.

DW-IAQHS 3.4