PRISM Analytical Technologies

IAQ Commercial Survey™
Reveal

Sample Report

Client: Air Quality Inspections
1245 Main St. Suite B
Pleasantville, MA 84847
U.S.A.

Sampled By: Alex Carter
Project: Smith
Location: 123 W. Maple Ave.
Boston, MA 25478

Report Number: 6010

Thank you for using
IAQ Commercial Survey!
If you have questions about your report, please contact your service provider who performed this test.

Order Date: 01/02/2013
Report Date: 01/08/2013

IAQ Commercial Survey™ is one of the most advanced, trusted air testing products on the market today for identifying chemical sources and active mold growth. Many indoor air quality (IAQ) issues identified by IAQ Commercial Survey can be easily remediated or eliminated. This test is an invaluable tool for improving air quality because it provides important information on potential contamination issues that cannot be detected by a visual inspection alone. Acting upon the information in this report will enable you to dramatically improve the air quality, creating a healthier environment.

What's in your Indoor Air Quality Report?

Your Indoor Air Quality Report has several sections describing different aspects of your air quality.

1. **Formaldehyde:** lists the concentration, severity, and some potential sources (separate submitted sample).

2. **The Total Volatile Organic Compound (TVOC) level:** a general indicator of the IAQ. Typically, a lower TVOC means better IAQ in the sampled location.

3. **The Total Mold Volatile Organic Compound (TMVOC) level:** an assessment of the actively growing mold. Levels above 8 ng/L indicate that there is a source of actively growing mold in the sampled location.

4. **The Contamination Index™ (CI):** shows the types of air-contaminating products and materials that are present in the sampled location. Each CI category shows the approximate contribution of that category to the TVOC level, indicates how your location compares to thousands of other locations, and provides some suggestions for where these products and materials might be found. The CI is divided into two main sections: Building Sources and Occupant Sources. Building Sources are those that are typically part of the structure of the building and may be more difficult to reduce in the short term. Occupant Sources are those that the occupants bring into the building and can usually be more readily identified and remediated. The values assigned to each category are approximations based on typical office and commercial spaces. Locations with additional or atypical sources may require investigation to determine the source of certain chemicals that are not accurately represented by the CI. Levels indicated as Elevated, High, or Severe should be addressed immediately, and those listed as Moderate are areas that can be improved over time. Since there are potentially many sources of VOCs, buildings can often be re-contaminated even after sources have been removed because new products are constantly being brought into the building. Occupants should take note of this fact, and view IAQ as a continuous improvement process.

5. **EPA Hazardous Air Pollutants (HAPs):** listing of the chemical compounds measured with the IAQ Commercial Survey test that are known or suspected to have serious health or environmental effects (also known as air toxics).

6. **TDT Air Scan®:** comprehensive record of all compounds detected in the air sample above the listed reporting limit, including, but not limited to, those compounds contained in the Air Survey Analysis List (TB503, Rev. 15, Quantitative List A and Semiquantitative List).

Prism Analytical Technologies, Inc., the creator of IAQ Commercial Survey, has been performing air quality assessments to industry and environmental consultants since 1995. Prism Analytical Technologies, Inc. (ID 166272) is accredited by the AIHA Laboratory Accreditation Programs (AIHA-LAP), LLC in the Industrial Hygiene accreditation program for GC/MS Field of Testing as documented by the Scope of Accreditation Certificate and associated Scope. Reference VOCs methods NIOSH 2549 and Prism IAQCS.

Formaldehyde Sample

Client Sample ID: Office
Sample Volume (L): 5.0
Date Sampled: 12/31/2012
Sample Type: TDT 112J

Laboratory ID: 6010-2

Scan Date: 01/03/2013

Formaldehyde Concentration: 30 ng/L (24 ppb)

Your Formaldehyde Level (Highlighted)

Low	Average	Elevated	High
0-20 ng/L	20-50 ng/L	50-100 ng/L	100 + ng/L

Recommendation: Average formaldehyde level but improvements can be achieved by locating and removing sources. See formaldehyde sources section below.

Formaldehyde Exposure Limits

The National Institute for Occupational Safety and Health (NIOSH) has set a recommended exposure limit (REL) of 20 ng/L (16 parts per billion). The Occupational Health and Safety Administration (OSHA) has set a **workplace permissible exposure limit** (PEL) of 936 ng/L (750 parts per billion). For more information on exposure limits, see this report about Environmental Health.

Because of the number and range (from a few ppb to almost one ppm) of published exposure limits, the levels displayed above are based on the statistical distribution of concentrations Prism has gathered rather than exposure limits.

Formaldehyde Sources

he main sources of formaldehyde are composite or engineered wood products that contain urea-formaldehyde (UF) resins (e.g., particleboard, hardwood plywood paneling, medium density fiberboard). Products that contain phenol-formaldehyde (PF) resin also emit formaldehyde but at lower concentrations (e.g., softwood plywood, flake or oriented strand board). Formaldehyde is also present in other building products such as pre-finished engineered flooring, insulation, glues and adhesives, and paints and coatings, as well as textiles, disinfectant cleaning products and soaps, preservatives, cosmetics, some air fresheners, pet care products, bactericides and fungicides. Formaldehyde is also a byproduct of many combustion processes, such as tobacco smoke and fuel-burning appliances (gas stoves, kerosene space heaters and fireplaces).

The resources listed below provide additional information about formaldehyde.

US Environmental Protection Agency
http://www.epa.gov/iaq/formaldehyde.html
http://www.epa.gov/ttn/atw/hlthef/formalde.html

Agency for Toxic Substances and Disease Registry (ATSDR)
http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=219&tid=39

National Institutes of Health (NIH)
http://www.niehs.nih.gov/health/materials/fact_sheet_formaldehyde.pdf
http://toxtown.nlm.nih.gov/text_version/chemicals.php?id=14
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2855181/

Note: This analysis was performed using the Hantzsch method. This test method has been correlated with or is compliant with the California Air Resources Board (CARB) § 93120, European DIN Standard EN-717, and ASTM methods D-5582 and E-1333. It has also been compared with DNPH testing used in NIOSH 2016 and found to be in good agreement.

PRISM Analytical Technologies

IAQ Commercial Survey™ **Reveal**

Sample Report

VOC Sample

Client Sample ID: Office
Sample Volume (L): 24.0
Date Sampled: 12/31/2012
Sample Type: TDT 112J

Client Sample ID: Office
Laboratory ID: 6010-1
Scan Date: 01/02/2013

Total Volatile Organic Compound (TVOC) Summary

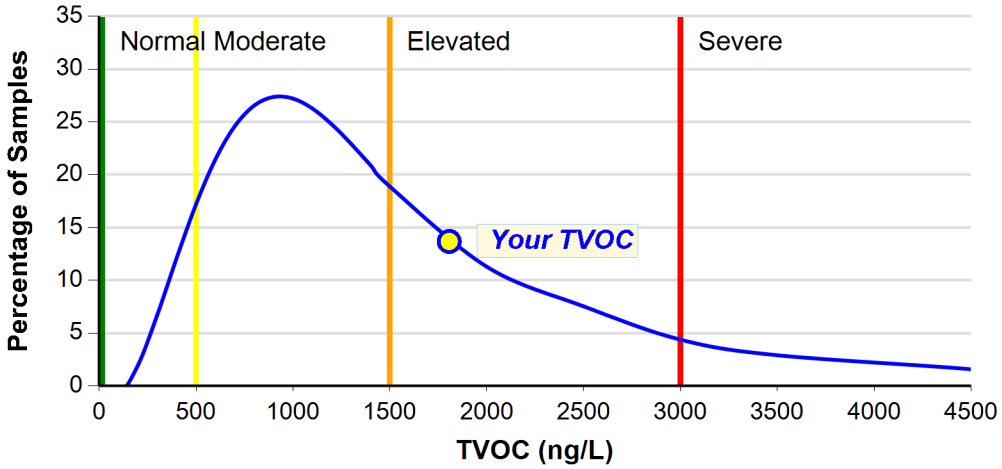
Your TVOC Level is: 1800 ng/L

IAQ needs improvement; effect on occupants is possible; reduce potential sources and increase ventilation.

Your Indoor Air Quality Level (Highlighted)

Normal	Moderate	Elevated	Severe
< 500 ng/L	500 - 1500 ng/L	1500 - 3000 ng/L	> 3000 ng/L

All IAQ Survey TVOC Air Quality Indicator



The average TVOC is 1900 ng/L

This chart represents the TVOC distribution of over 8,000 samples. Over 80% of these samples indicate improvements in IAQ are necessary to achieve the goal of TVOC less than 500 ng/L.

The chart above shows the TVOC levels for all locations tested using IAQ Survey. 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 locations (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.

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. As the TVOC increases, the probability of adverse effects increases. The 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 IAQ Survey methodology.

The presence of chemicals in your sampled location 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.). In some cases, these conditions may make the location uninhabitable. 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. The following websites can offer more information:

US EPA Indoor Air Quality (IAQ)
American Lung Association Healthy Air at Work
World Health Organization (WHO) Guidelines for Indoor Air Quality
Lawrence Berkeley National Laboratory Indoor Volatile Organic Compounds (VOCs) and Health

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 Compoiund (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.

Client Sample ID: Office
Laboratory ID: 6010-1

Total Mold Volatile Organic Compound (TMVOC) Summary

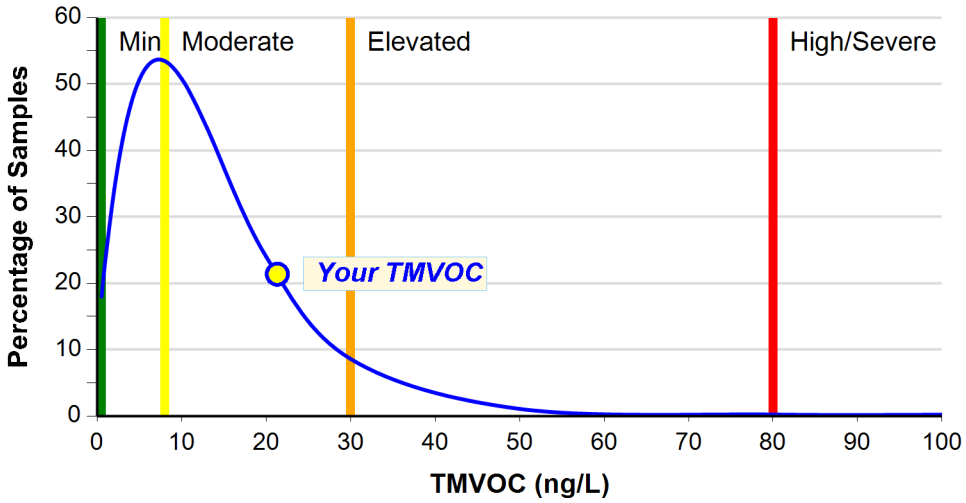
Your TMVOC Level is: 21 ng/L

Actively growing molds are present, individuals sensitive to molds will likely be affected.

Your Active Mold Level (Highlighted)

Minimal	Active-Moderate	Active-Elevated	Active-High	Active-Severe
< 8 ng/L	8 - 30 ng/L	30-80 ng/L	80 - 150 ng/L	150 + ng/L

All IAQ Survey TMVOC
Active Mold Growth Indicator



The average TMVOC is 10 ng/L

This chart represents the TMVOC distribution of over 8,000 samples. Approximately half the samples indicate that some active mold growth is occurring at the time of sample collection.

The chart above shows the TMVOC level for all locations tested using IAQ Survey. 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 locations (indicated on the vertical y-axis) and the TMVOC level (indicated on the horizontal x-axis). For example, a TMVOC of 20 ng/L is reported in ~20% of the samples. The green, yellow, orange, and red vertical bars represent divisions between Minimal, Moderate, Elevated, and High/Severe TMVOC levels.

Molds are fungi that grow in the form of multicellular filaments called hyphae that spread to form a network or colony called mycelium. There are thousands of known species of molds, although a much smaller number of mold species are commonly found in indoor environments.

Molds can affect humans and animals in their vicinity in several ways. The most commonly known aspect of molds is the spores they produce as their primary means of reproduction. Spores are released from the mature mold body and spread by air currents and on people, animals, or materials that travel from place to place. These spores can remain viable for a long time until they find a suitable environment and grow to form new colonies. In addition to spores, mycotoxins can also be released under certain situations. Mycotoxins are chemicals that are produced during certain parts of the mold life cycle and can evoke a toxic response (e.g., severe allergic reactions and respiratory irritation and exacerbation of asthma symptoms or other respiratory ailments) in humans and animals. Mycotoxins have low volatility, meaning they have relatively low concentrations in air, so contact or ingestion rather than inhalation is often the main route of exposure for these chemicals.

Finally, mold VOCs (MVOCs) are produced during the metabolic or digestive processes of molds and therefore can be used as an indicator of actively growing mold. When mold is in an inactive or dormant state it does not produce many MVOCs and so cannot be used as an indicator of inactive mold. There are a number of factors that can affect the production and movement of MVOCs, including but not limited to the genus/species, ventilation rates, temperature, humidity, growth surfaces, and competition from other molds. These factors make determination of the genus/species of mold very difficult so the presence of MVOCs indicates active mold growth but not the genus/species of the mold.

Total Mold Volatile Organic Compound (TMVOC) Summary

Mold can grow anywhere that satisfies four primary conditions.

1. Presence of mold spores – spores are everywhere and it is very difficult if not impossible to remove them completely.

2. Appropriate growth surface or nutrient source – molds are adaptable and can grow on almost any surface; many molds especially like cellulose-based materials (e.g., wood, drywall, insulation, cardboard, paper, carpet, etc.).

3. Appropriate temperature – although many molds grow best in warmer temperatures, given enough time mold can grow at almost any temperature condition.

4. Water – this is the most significant and most important criteria since the other conditions are too commonly available to be controlled. The consensus of most organizations with a perspective on air quality (e.g., WHO, EPA, AIHA, ASHRAE, etc.)[a] is that controlling moisture and dampness is the only way to consistently control or limit mold growth.

Mold Sources

Since there are so many possible locations that mold can grow, it can be difficult to locate without visual indicators. However, there are some potential locations where molds are often found, as listed here.

- Air conditioning units or drain lines
- Near plumbing leaks
- Near roof or wall leaks
- Basement water intrusion from surrounding soil
- Any consistently humid area
- Near condensation around windows or any other condensation locations like exterior walls (typically where there is a temperature gradient that allows water to condense)
- Freezer/refrigerator door seals, drain lines, or drip pans; especially in summer
- Indoor plants
- Empty beverage containers and glasses, especially if left for trash or recycling without being rinsed out
- Wastebaskets and trash cans containing discarded food or wet items
- Stand pipes and traps
- Books, magazines, and newspapers if they have gotten wet or sit for a long time
- Outside mold, especially if the air intake is near the ground and landscaping near the building uses wood chips or mulch

Typically, if there is no plumbing leak, condensation, or water intrusion into the building, there will not be a mold problem. If active mold growth is indicated, the first step in fixing the problem is to find and repair the water intrusion or moisture build up.

Some new or extensively renovated buildings can have high MVOC results. Additional dampness is often introduced into a new building during the construction process (e.g., newly installed cement) and can lead to optimal mold growth conditions. Also, some building materials may have mold growth on them when they are installed due to exposure to water before installation. It is strongly recommended that new buildings or those with extensive renovation undergo a drying process to eliminate or reduce the potential for mold growth.

Total Mold Volatile Organic Compound (TMVOC) Summary

MVOC Interpretation

As described above, the TMVOC value is an assessment of the quantity of actively growing mold in the sampled location. Like TVOC, no government unit or organization has specified limits for TMVOC. 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. 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.

TMVOC (ng/L)	Level	Description
< 8	Minimal or Ambient	Actively growing molds may be present, but are at or below levels found in most building (i.e., these levels could be considered ambient or background).
8 - 30	Active - Moderate	Actively growing molds are present, but are at levels which typically only affect people sensitive to molds. Investigate possible water or moisture sources. See Mold Sources
30 - 80	Active - Elevated	Significant levels of actively growing molds are present; reactions or symptoms are probable. See Mold Sources
80-150	Active - High	High levels of actively growing molds are present; high probability that all occupants will be affected; take immediate action to locate and remove mold. See Mold Sources
> 150	Active - Severe	Excessive levels of actively growing molds are present; all occupants will be affected; take immediate action to locate and remove mold. See Mold Sources

Additional Information about Mold

[a] 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)

Client Sample ID: Office
Laboratory ID: 6010-1

Contamination Index™

The Contamination Index™ (CI) shows the types of air-contaminating products and materials that are present in the sampled area. Each CI category shows the approximate contribution of that category to the TVOC level, indicates how your location compares to thousands of other locations, and provides some suggestions about which products and materials might be the source for the VOCs. The CI is divided into two main source groups: Building Sources and Occupant Sources.

1. Building Sources are those that are typically part of the structure of the building 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 or application of these products, especially if the area is flushed with air to dissipate the VOCs off gassed from the new products or materials.

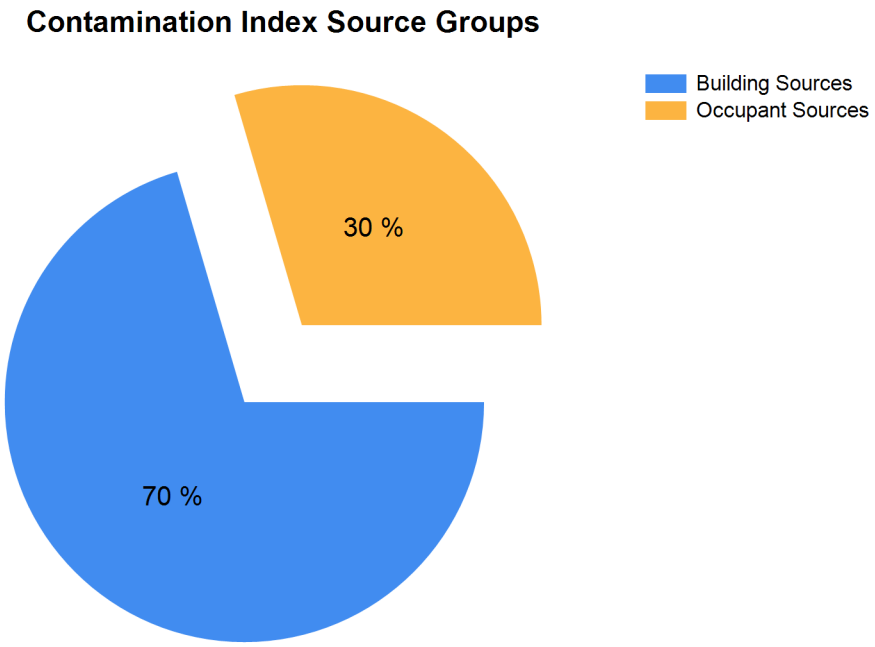
2. Occupant Sources are those that the occupants of the building bring into the building and can usually be more readily identified and remediated. Recent construction or renovation can often contribute to other source categories in addition to Building Sources.

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 Sources group because the largest contribution is typically the paint on the walls, but cans of paint stored in a basement or storage area could be considered part of the Occupant Sources group. Always consider all possible sources for a particular CI category.

The CI categories comprise the most common sources but other products or activities may be present that are not included in the CI. The values assigned to each category are approximations based on typical office and commercial spaces. Locations with additional or atypical sources may require additional investigation to determine the source of certain chemicals that are not accurately represented by the CI.

Since there are potentially many sources of VOCs, buildings can often be re-contaminated even after sources have been removed because new products are constantly being brought into the building. Occupants 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. These source groups are estimates and may not indicate all of the VOCs in your air sample.



Client Sample ID: Office
Laboratory ID: 6010-1

Contamination Index™ Building Sources

Use the Contamination Index (CI) below to help you find products and materials in the sampled area 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 building and may be more difficult to reduce in the short term. Recent construction or renovation will often cause these categories to be elevated. Increased ventilation will help to reduce VOCs from construction or renovation sources. Levels indicated as Elevated, High, or Severe should be addressed immediately, and those listed as Moderate are areas that can be improved over time.

Building Sources

Contamination Index Category	Estimated VOC Level (ng/L)	Severity	Source Prediction & Suggestions for VOC Reduction
Coatings (Paints, Varnishes, etc.)	630	**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. Dispose of opened but unused products and related supplies if possible or store in areas that will minimize off gassing. Additional sources include fuel oil or diesel fuel.
PVC Cement	13	**Moderate**	PVC cement is used to join pieces of PVC pipe together, usually for plumbing. Chemical compounds in these products can cause respiratory irritation and headaches. Ventilate the area during and after use.
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	100	**Normal**	VOCs from gasoline are typically a result of off-gassing from gas containers, small spills, and gas-powered equipment used in facilities maintenance in nearby garage or storage areas. Most vehicles in good operating condition do not emit gasoline vapors due to the tightly sealed gas tank. This category does not include exhaust emissions. Gasoline VOCs can linger on clothing after refueling at a gas station. Gasoline includes chemical compounds that are also included in the Light Solvents category.
Fuel Oil, Diesel Fuel, Kerosene	0	**Normal**	Typically found in garages and facilities maintenance areas. These fuels are not very volatile so they will not readily get into the air, but they can linger for a long time and produce a strong, unpleasant odor. This category does not include exhaust emissions. Additional sources include coatings such as paints, varnishes, sealants, waxes, etc.
Light Hydrocarbons	160	**Normal**	Building materials; aerosol cans; liquefied petroleum gas (LPG); refrigerant; natural gas; propellant; blowing agent. Includes chemical compounds such as propane, butane, and isobutane.
Light Solvents	450	**Moderate**	Stoddard solvent; mineral spirits; some coatings (paints, varnish, enamels, etc.); wax remover; adhesives; automotive products; light oils. Many of these are present in common consumer products; however, recent renovation or construction will increase these levels. Increase ventilation during and after use of these products. Typically, VOCs from these products are in the 6 to 9 carbon size range. Gasoline can contribute to the Light Solvents

Client Sample ID: Office
Laboratory ID: 6010-1

Contamination Index™ Occupant Sources

Use the Contamination Index (CI) below to help you find products and materials in the sampled area 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 building by the occupants and can often be readily identified and removed or contained. Levels indicated as Elevated, High, or Severe should be addressed immediately, and those listed as Moderate are areas that can be improved over time.

Occupant Sources

Contamination Index Category	Estimated VOC Level (ng/L)	Severity	Source Prediction & Suggestions for VOC Reduction
HFCs and CFCs (FreonsTM)	4	**Normal**	Most often used as refrigerants for air conditioners and refrigerator/freezers and propellants for blown-in insulation, cushions, aerosol cans, etc. Many of these chemical compounds are being phased out because of the Montreal Protocol.
Personal Care and Cleaning Products	400	**Moderate**	Personal care products such as soap, deodorant, lotions, perfumes, hair coloring supplies, nail care supplies, oral hygiene products, etc. Cleaning agents such as surface, window, and flooring products, also restroom and antibacterial products. These products contain many VOCs that will dissipate if use is discontinued or reduced. Consider storing these products in a closed container or enclosed ventilated area such as a cabinet or closet when not in use. Increase ventilation when using these products if possible.
Odorants and Fragrances	160	**Moderate**	Air fresheners, scented cleaning products, and scented personal care products. Reduce use of scented products and store in a closed container or enclosed ventilated space such as a cabinet or closet.
Dry Cleaning Solvents	4	**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.

TDT Air Scan®

Client Sample ID: Office
Laboratory ID: 6010-1

The TDT Air Scan analysis is a comprehensive listing of all compounds detected in the air sample above the listed reporting limit, including, but not limited to, those compounds contained in the Air Survey Analysis List (TB503, Rev. 15, Quantitative List A and Semiquantitative List).

Quantitative List A Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	Additional Information
Methylene Chloride	75-09-2	1.3	0.4	0.2	
Benzene	71-43-2	2.2	0.7	0.2	
Toluene	108-88-3	12	3.1	0.2	
Tetrachloroethene	127-18-4	3.5	0.5	0.2	
m,p-Xylene	106-42-3	5.0	1.1	0.4	
o-Xylene	95-47-6	1.7	0.4	0.2	
p-Isopropyltoluene	99-87-6	3.0	0.5	0.2	
Naphthalene	91-20-3	2.1	0.4	0.2	

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Isobutane	75-28-5	64	27	4	279	
1-Chloro-1,1-difluoroethane	75-68-3	4	1	4	289	
Butane (C 4)	106-97-8	130	55	4	300	
Pentane (C 5)	109-66-0	84	28	4	500	
Ethanol	64-17-5	440	230	4	515	
Acetone	67-64-1	100	41	4	543	
Hexane (C 6)	110-54-3	32	9	4	600	
Ethylacetate	141-78-6	17	5	4	660	
Tetrahydrofuran	109-99-9	7	2	4	669	
Cyclohexane	110-82-7	48	14	4	671	
3-Methylhexane	589-34-4	13	3	4	677	
C6-C8 Hydrocarbon	N/A	34	N/A	4	704	
Heptane (C 7)	142-82-5	8	2	4	706	
1-Methoxy-2-propanol	107-98-2	6	2	4	727	

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1-Butanol	71-36-3	15	5	4	732	
Methylcyclopentane	96-37-7	23	7	4	740	
Methyl methacrylate	80-62-6	10	3	4	751	
Hexanal	66-25-1	25	6	4	859	
C7-C9 Hydrocarbon	N/A	8	N/A	4	891	Contains oxygen; probably an alcohol
Octamethyltrisiloxane	107-51-7	13	1	4	921	
a-Pinene	80-56-8	48	8	4	957	
Camphene	79-92-5	7	1	4	989	
C8-C10 Hydrocarbon	N/A	10	N/A	4	993	
C9-C11 Hydrocarbon	N/A	35	N/A	4	1015	Contains nitrogen
C9-C11 Hydrocarbon	N/A	33	N/A	4	1046	Contains oxygen; possibly an aldehyde
Limonene	138-86-3 or 5989-27-5	39	7	4	1058	Limonene (CAS 138-86-3) or d-Limonene (CAS 5989-27-5)
C9-C11 Hydrocarbon	N/A	43	N/A	4	1058	
C10-C12 Hydrocarbon	N/A	7	N/A	4	1058	At least one degree of unsaturation
C10-C12 Hydrocarbon	N/A	41	N/A	4	1096	cyclic
C10-C12 Hydrocarbon	N/A	12	N/A	4	1104	Substituted aromatic
Decahydronaphthalene	91-17-8	12	2	4	1134	
Dipropylene glycol	110-98-5; 106-62-7; 108-61-2	14	3	4	1138	
C10-C12 Hydrocarbon	N/A	16	N/A	4	1151	Sum of three overlapping hydrocarbons
Nonanal	124-19-6	13	2	4	1168	
1-Methyl-2-pyrrolidinone	872-50-4	8	2	4	1185	
Acetophenone	98-86-2	9	2	4	1194	
Dodecane (C 12)	112-40-3	5	0.7	4	1198	
C11-C13 Hydrocarbon	N/A	19	N/A	4	1285	
C12-C14 Hydrocarbon	N/A	11	N/A	4	1378	
C12-C14 Hydrocarbon	N/A	17	N/A	4	1431	
Texanol-B	74367-34-3	40	4	4	1473	

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Texanol-A	74367-33-2	28	3	4	1476	

EPA Hazardous Air Pollutants (HAPs)

Client Sample ID: Office
Laboratory ID: 6010-1

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 reported in this air sample, this list does not include all HAPs. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

Compound	CAS	Estimated VOC Level (ng/L)	Estimated VOC Level (ppb)	NIOSH Exposure Limit	Description
Methylene Chloride	75-09-2	1.3	0.4	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Hexane (C 6)	110-54-3	32	9	180,000 ng/L (50,000 ppb)	Solvent; adhesive; grease; lubricant; paints and coatings; petroleum fuel component
Benzene	71-43-2	2.2	0.7	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
Methyl methacrylate	80-62-6	10	3	410,000 ng/L (100,000 ppb)	Acrylic polymers for paints and coatings, adhesives, fillers; solvent; pharmaceuticals; personal care
Toluene	108-88-3	12	3.1	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
Tetrachloroethene	127-18-4	3.5	0.5	Carcinogen	Dry cleaning; adhesives, automotive cleaners, polishes
m,p-Xylene	106-42-3	5.0	1.1	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	1.7	0.4	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
Naphthalene	91-20-3	2.1	0.4	50,000 ng/L (10,000 ppb)	Gasoline; diesel; Moth balls/crystals; insecticide

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

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