

Air Analysis For: J Cantrell 2258
Location Tested: 485 W. Maple Ave.
 Boston, MA 25478

Sampling Professional: Alex Carter
 Prism Analytical Technologies
 2625 Denison Drive
 Mt. Pleasant, MI 48858

Client Sample ID: Main Floor
Sample Amount (L): 24
Date Sampled: 10/19/2021
Sample Type: TDT 153J
Sample Condition: Acceptable

Report Number: 6010
Laboratory ID: 6010-4

Received Date: 10/21/2021
Approved Date: 10/25/2021
Scanned Date: 10/25/2021
Report Date: 10/29/2021

For this analysis, Tobacco Smoke (TS) is defined as secondhand smoke or environmental tobacco smoke (the mixture of smoke generated by sidestream smoke, i.e., the burning end of tobacco products, and the mainstream smoke exhaled by smokers) as well as third hand smoke or stale tobacco smoke (the smoke residue that has off-gassed into the air and is still present after smoking has ceased). This analysis examines the submitted sample for the presence of certain chemical compounds that are used as surrogates, i.e., TS marker compounds, for the thousands of chemical compounds present in TS. These marker compounds could indicate the presence of TS when they are present. In certain circumstances TS marker compounds may not be detected even though an odor may be noticeable; additional information regarding the specifics of this phenomenon can be found on page 2 of this report.

| Status | Tobacco Smoke Marker | | Sample Concentration | | Report Limit | Interpretation |
|-------------|----------------------|-----------|----------------------|-------------|--------------|---|
| | Compounds | CAS | ng/g | ng/g | ng/g | |
| Not Found | 2,5-Dimethylfuran | 625-86-5 | < 0.1 | < 0.03 | 0.1 | Not detected; TS may still be present at very low levels. |
| Trace | 3-Ethenylpyridine | 1121-55-7 | < 0.08 | < 0.02 | 0.08 | Trace amount detected; TS may still be present at low levels but cannot be confirmed. |
| Significant | Nicotine | 54-11-5 | 0.5 | 0.07 | 0.2 | Significantly above RL; TS likely permeates the sampled area. |

Notes: The sample was off gassed under a flow of nitrogen at 50 deg C for 10 minutes. The values reported do not represent total off gas.

Reporting Notes:

1. The reporting limit (RL) is the lowest amount that can be consistently determined and includes both the instrument response and sample volume.
2. '<' indicates the concentration is less than the reporting limit.

Results relate only to the item tested.

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

The results contained in this report were dependent upon a number of factors, which may include, but are not limited to, the sampling techniques utilized, the size or source of the sample, the compounds which make up the Tobacco Smoke and/or the type of Tobacco Smoke present (mainstream, secondhand, or third hand smoke). Therefore, neither Enthalpy Analytical, LLC (MTP), nor its agents, officers, directors, employees, or successors (1) expresses any opinion about action which may or should be taken based upon the results provided and (2) shall not be liable for any claims, actions, causes of action, costs, loss of service, expenses and compensation whatsoever which may now or hereafter occur or accrue based upon the information contained herein.

Enthalpy Analytical, LLC (MTP) (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. This analysis references methods EPA TO-17 and ISO 16000-6, which fall within the Scope of Accreditation.

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Results Discussion

There are a number of factors that can influence how tobacco smoke travels in air, settles on surfaces, and how long it is detectable, including but not limited to:

- amount, duration, and location of smoking
- how long the smoking has been occurring (e.g., weeks, months, years)
- type of material and construction of the wall/floor/ceiling
- building envelope (i.e., how tight is the building)
- air exchange rates
- temperature and humidity
- amount of porous materials (e.g., carpet, draperies, furniture, etc.)
- location of the sample collection equipment
- whether sample collection occurs in the same area as the smoking or in an adjacent space

The resultant level of tobacco smoke markers in the sample will be influenced by how these factors combine. In some situations a tobacco smoke odor may be perceptible and the marker compounds could be low or not detected. Although the marker compounds encompass a range of chemical classes and volatilities, the odor produced by tobacco smoke is comprised of a complex mixture of chemical compounds that may not be fully accounted for with the marker compounds.

Multiple tobacco smoke markers are used because different situations may cause one or more of the markers to be undetected. For example, nicotine is not very volatile so it does not readily pass through walls and in situations where sampling is occurring in an adjacent space nicotine may not be detected.

Most Tobacco Smoke (TS) values are less than 1 ng/L although TS values considerably higher have been reported. Tobacco smoke residues can remain for a long time and tobacco smoke marker compounds have been detected months after smoking occupants have vacated the sampled area. Sampling for tobacco smoke markers coming from an adjacent area or unit (e.g., multi-unit dwelling such as an apartment, town home, or condo) can sometimes yield a nondetectable TS value because of the factors listed above.

Health Concerns

There is no safe level of exposure to tobacco smoke. The U.S. Environmental Protection Agency, the U.S. National Toxicology Program, the U.S. Surgeon General, and the International Agency for Research on Cancer have all classified tobacco smoke as a known human carcinogen (a cancer-causing agent).

Additional Information

The resources listed below can provide additional information about tobacco smoke issues.

[U.S. Surgeon General Report 1964: Smoking and Health](#)

[U.S. Surgeon General Report 2014: The Health Consequences of Smoking-50 Years of Progress](#)

[U.S. EPA Secondhand Smoke](#)

[American Cancer Society Cigarette Smoking](#)

[American Lung Association](#)

[National Cancer Institute Secondhand Smoke and Cancer Fact Sheet](#)

[World Health Organization \(WHO\) Tobacco Fact Sheet](#)