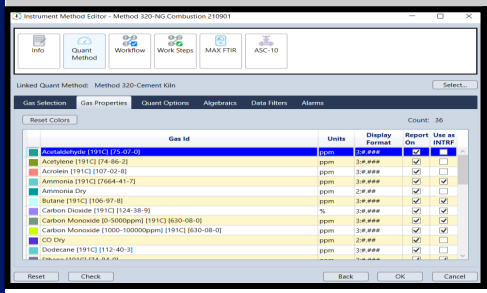
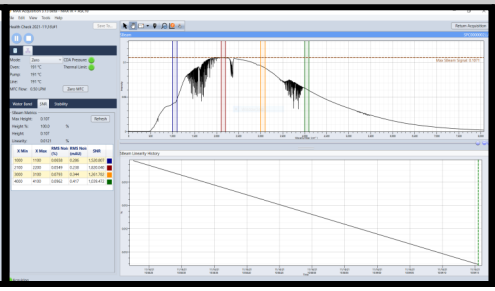
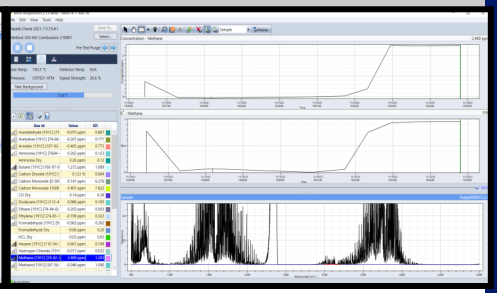
FTIR TESTING







Why Air Hygiene FTIR Labs are the Solution for your Testing Needs!

- Nine (9) FTIR labs for formaldehyde, VOC's, & HAPS by EPA Method 320/321, ASTM D-6348, and Turbine MACT!
- Real-time data on-site for evaluation!
- On-site draft test reports & final report in 5 Days!
- Catalyst performance analysis (inlet & outlet testing) on-site with real-time data!
- Speciated VOC's on-site!
- STARBOOST - Low Level (ppb) formaldehyde.
- Greenhouse Gases measured real-time, on-site (N2O, CO2, CH4)!
- SCR tuning with point-by-point data, real-time for NH3, NO, & NO2!
- Portable power by on-board generator!
- Hardworking, flexible testing teams!
- Tests in all 50 states, Mexico, & Canada!
- Over 25 years of testing in gas industry!

Corporate Headquarters:
1600 West Tacoma Street
Broken Arrow, OK 74012

(918) 307-8865
(888) 461-8778

AIR HYGIENE, INC.

Remote Office Locations:
Chicago, IL
Shreveport, LA
Las Vegas, NV
Austin, TX
Fort Worth, TX
Pittsburgh, PA

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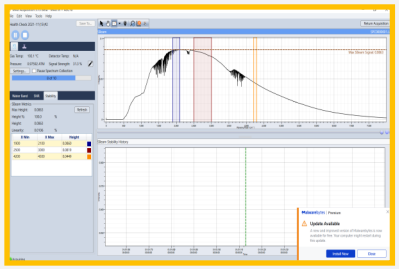
FTIR Compounds

Any gas or liquid compound that absorbs infrared light can potentially be identified and quantified using the FTIR. The gas phase infrared spectral standards are available for the compounds listed below. Reference spectra not included in this list may be already available or can be prepared.

acetaldehyde
acetic acid
acetone
acetonitrile
acetophenone
acrylic acid
acrylonitrile
allyl chloride
2-amino-2-methyl-1-propanol
ammonia
aniline (phenylamine)
arsine
benzene
benzotrichloride
benzyl chloride
beta-propiolactone
bis (chloromethyl) ether
boron trichloride
boron trifluoride
bromoform
1,3-butadiene
1-butanol
butyl acetate
carbon dioxide
carbon disulfide
carbon monoxide
carbon tetrachloride
carbonyl fluoride
carbonyl sulfide
chloroacetic acid
2-chloroacetophenone
chlorobenzene
chloroform
chloromethyl methyl ether
chloroprene (2-chloro-1,3-butadiene)
m-cresol
o-cresol
p-cresol
cumene
cyclohexanone
1,2-dibromo-3-chloropropane
1,4-dichlorobenzene
dichloroethyl ether
1,3-dichloropropene
dichlorvos
difluoroethane
difluoromethane
dimethyl carbamyl chloride
dimethyl formamide
1,1-dimethyl hydrazine
dimethyl phthalate
1,4-dioxane - (1,4-diethylene oxide)
epichlorohydrin
1,2-epoxybutane
ethane
ethanol
ethyl acrylate
ethyl benzene
ethyl chloride (chloroethane)
ethylbenzene
ethylene
ethylene dibromide - (dibromoethane)
ethylene dichloride
ethylene oxide
ethylidene dichloride
fluoroethane
fluoromethane
formaldehyde
hexachlorobutadiene
hexachlorocyclopentadiene
hexachloroethane
hexamethylphosphoramide
hexane
hexyl acetate
hydrazine
hydrogen bromide
hydrogen chloride
hydrogen fluoride
isophorone
isopropanol
maleic anhydride
methane
methanol
methyl bromide - (bromomethane)
methyl chloride - (chloromethane)
methyl chloroform - (1,1,1-trichloroethane)
methyl ethyl ketone - (2-butanone)
methyl hydrazine
methyl iodide - (iodomethane)
methyl isoamyl ketone
methyl isobutyl ketone - (hexone)
methyl methacrylate
methyl tert butyl ether
methylene chloride-(dichloromethane)
n,n-diethyl aniline
nitric oxide
nitrogen dioxide
n-nitrosodimethylamine
n-nitrosomorpholine
naphthalene
nicotine
nitrobenzene
2-nitropropane
o-toluidine
oxygen difluoride
ozone
pentafluoroethane
perfluorobutane
perfluoroethane
perfluorohexane
perfluoromethane
perfluoropropane
perfluoropropene
phenol
phosphine
propane
1,2,3-propanetriol w/methyl oxirane
propionaldehyde
propylene dichloride
propylene glycol
propylene glycol methyl ether acetate
propylene oxide
1,2-propylenimine-(2-methyl aziridine)
qinoline
silane
silicon tetrafluoride
styrene
styrene oxide
sulfur dioxide
sulfur hexafluoride
sulfuryl fluoride
1,1,2,2-tetrachloroethane
tetrachloroethylene (perchloroethylene)
tetraethoxy silane (TEOS)
1,1,1,2-tetrafluoroethane
1,1,2,2-tetrafluoroethane
thionyl fluoride
toluene
2,4-toluene diisocyanate
1,2,4-trichlorobenzene
1,1,2-trichloroethane
trichloroethylene
2,4,5-trichlorophenol
triethylamine
1,1,1-trifluoroethane
1,1,2-trifluoroethane
trifluoromethane
tungsten hexafluoride
2,2,4-trimethylpentane
vinyl acetate
vinyl bromide
vinyl chloride
vinylidene chloride
m-xylene
o-xylene
p-xylene

HOW IT WORKS



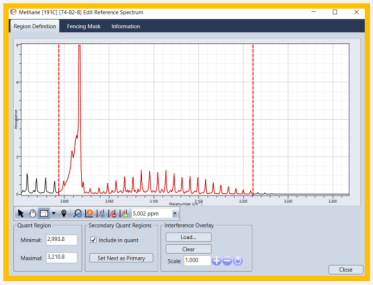
Fourier Transform Infrared (FTIR) Spectroscopy is used to examine and characterize organic and inorganic materials. Data is produced in the form of a spectrum, with many bands that represent chemical bonding between two particular atoms or a group of atoms in a molecule. The spectrum is subsequently compared to a set of known reference materials for identification and interpretation. As an analytic technique, FTIR has several advantages. It requires only a minute sample. It takes only minutes to conduct and it will work with most liquids or gases. Air Hygiene's sample system incorporates a heated sample pump and conditioning system to ensure data accuracy.

COMPOUND IDENTIFICATION AND DETECTION

The FTIR measures the absorption of various infrared light wavelengths by the material of interest. These infrared absorption bands identify specific molecular components and structures. Air Hygiene uses two different FTIR systems, the MKS2030 and the Max-iR both which are designed to be rugged, precise and mobile. The minimum detection limits (MDL) vary with the compound and the effluent matrix being measured. Typically, MDL's range from 40 ppb to 10 ppm depending on the compound of interest.

Recently, EPA has classified formaldehyde as a probable human carcinogen as formaldehyde exposure has been associated with reproductive effects such as menstrual disorders and pregnancy problems. As a result EPA has proposed to reduce the concentration of formaldehyde in the exhaust from new or reconstructed stationary combustion turbines to 91 parts per billion by volume or less, dry basis (ppbvd), at 15 percent oxygen (if you use means other than an oxidation catalyst emission control device). Air Hygiene uses an intensifying filter in the StarBoost FTIR for high sensitivity measurements of formaldehyde. The MDL for formaldehyde is 40 ppb.

DATA ANALYSIS



The FTIR spectrometer system consists of an interferometer (MKS2030 or Max-iR), a heated sample pump (ASC10), and a computer. With an infrared data station, the computer acquires, processes, stores and retrieves spectral data. Max Acquisition, a powerful new automated, multi-component, quantitative analysis program, is used for analyzing gas phase mixtures in real time. This software also allows for custom methods and individualized interferent recognition to be completed on site to help improve the accuracy of the results proved. Quantitative results, concentration vs. time plots, and spectra can be displayed and updated in real-time for continuous monitoring applications.

The spectra or the interferogram is a permanent record and can be analyzed at a future time to identify and quantify additional compounds not known during the initial testing program. For example, if the sample was tested for only ammonia and formaldehyde, following the test, the tester is able to identify and quantify toluene, benzene, and acetaldehyde without repeating the test. This ability to perform post-test analysis for additional compounds will save you both time and money.

FTIR TRUCK

The FTIR Truck is a mobile FTIR Testing solution that is rugged and compact with the ability to test in some of the most remote locations. This system is fully integrated with stand alone power generation and has the full capabilities of HAPs testing all inside the shell of a Chevy 2500.

QUALITY ASSURANCE

Air Hygiene's goal is to achieve total customer satisfaction by delivering accurate, on-time analyses that meet each client's needs. It is our responsibility to provide each client with quality results. This is accomplished by documenting all facets of the analysis, communicating any questionable or out-of-specification results to the client, following procedures and complying with standards, and auditing data internally.

Testing Solutions for a Better World

Air Hygiene International, Inc. is a privately held professional service firm incorporated on March 1st, 1997. Its mission is to reduce its client's exposures to regulatory, civil, and criminal liabilities related to air emissions through superior testing services, risk identification, and management services. **Air Hygiene** accomplishes this mission by looking beyond mere compliance, toward strategies that encompass potential future liabilities as well as community responsibility.

Headquartered in Broken Arrow, Oklahoma, Air Hygiene serves clients throughout the continental United States as well as internationally. Its client base includes companies from various industries including oil and gas companies, utilities, manufacturers, and others.

Air Hygiene has experienced engine testing teams led by project managers with significant testing experience and a broad understanding of the federal and state regulations. **Air Hygiene** has over fifity (50) combustion emission testing systems. **Air Hygiene** test labs have on-board printers to allow on-site reporting of critical data for the client to review immediately following the testing.

Our pricing and flexibility are second to none (2-2-0). **Air Hygiene** prides itself on testing efficiency and has experience with complex testing. Including formaldehyde by FTIR (EPA Method 320 or ASTM D-6348) to meet RICE MACT, non-methane/ethane VOCs on-site with field GC or FTIR for JJJJ (40 CFR Part 60 Subpart JJJJ), PM, PM-10, & PM-2.5 tests (EPA Methods 1-5, 201a, 202).

Air Hygiene can complete numerous engines in a single day and has experience with testing large engine fleets within short duration or on a repeated schedule to meet periodic monitoring requirements. **Air Hygiene** has eight (8) FTIR labs!

Below are some of AHI's satisfied customers. Please contact us for more information or a quick quotation for your next project!

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