

Check Your Emissions Levels With a Whole New Level of Confidence.

FTIR Spectroscopy by Enthalpy—accuracy supported by experience



Near-real-time analyses. Multiple compounds. Stack testing. Industrial process gas streams. Lab-scale emissions characterizations. When it comes to source testing, FTIR spectroscopy is the single most versatile technology for gas phase analysis. But just owning the equipment isn't enough.

Generating useful, defensible FTIR data requires competent analysts with a deep understanding of the science and hands-on FTIR testing experience. That's where Enthalpy stands out. We don't just have state-of-the-art equipment. We have more of it than anybody else and we have the people and the experience to really make it work.

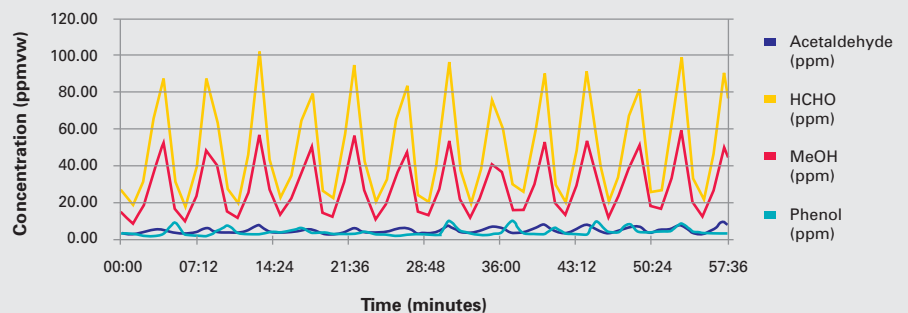
Start with the fact that we can field four or more instruments. By multiplexing them, we can test up to 12 locations simultaneously. Our capabilities range from one day SF₆ capture efficiency tests to multi-month testing projects.

Then there's our FTIR director, Grant Plummer. He's nationally recognized for developing FTIR technology and EPA methods as well as training analysts. And don't forget about our experience. We've got more than a decade performing testing and Method 301 validations. In fact, since 1995, we've successfully collected millions of FTIR spectra from hundreds of field locations throughout the United States. Our FTIR team performs more than 50 projects a year.

On top of all that, Enthalpy's founders and senior staff members are former stack testers. So when it comes to FTIR source testing, let's just say, we truly get it.

Impressive equipment. Solid science. Extensive experience. In the field of FTIR testing, Enthalpy offers a whole new level of competence. And that means you can have a whole new level of confidence.

Emissions Profile from a Wood Product Press Vent



The Benefits of FTIR vs. Traditional Analytical Techniques

IMPROVED EFFICIENCY

With FTIR, an investigator can simultaneously measure combinations of acid gasses, HAPs, VOCs and criteria pollutants that would otherwise require three or more test methods.

QUICK RESULTS

Data is provided in near-real-time, facilitating process optimization and monitoring for sources with quickly changing emissions.

INCREASED SENSITIVITY AND RANGE

Our laboratory-grade analyzers are effective from percent concentrations to low ppm levels for most compounds and to ppb levels for many analytes and matrices. FTIR instruments can handle wide concentration swings without recalibration.

DATA AVAILABLE FOR FUTURE INVESTIGATIONS

FTIR data may be revisited in the future to identify and quantify additional or previously unconsidered targets.

Gas Phase FTIR Spectroscopy

- Onsite analysis for engineering and compliance
- Reporting limits from ppbv to percent levels
- Simultaneous analysis of multiple organic and inorganic compounds
- Near-real-time results
- Suitable for stacks, vents, process and indoor air evaluations
- Adaptable to a variety of industry types and processes
- Excellent for indoor exposure, materials off-gassing evaluations and variable emissions sources

Enthalpy's FTIR Services

- Compliance testing for stationary sources
- Pre-testing for MACT/control device optimization
- Engineering and process optimization
- Material off-gassing characterizations
- Pharmaceutical products/API Testing
- FTIR spectra generation and data review
- Innovative applications for challenging testing situations
- Consulting for instrument manufacturers, regulatory agencies, military agencies, venture capital groups, and industrial clients
- Expert interpretation and application of EPA Methods 318, 320, 321, PS-15, ASTM Standard D6348, and NIOSH Analytical Method 3800
- EPA Method 301 validations for specific analytes or test matrices
- Bag and tank analysis

Field Testing Experience

Chemical manufacturers	Tobacco processors
Semiconductor manufacturers	Filter paper manufacturers
Cement and lime kilns	Fiberglass manufacturers
Pulp and paper producers	Oil, coal, gas-fired boilers
Wood product formulation	Hazardous, municipal waste incinerators
Waste combustors	Asphalt producers
US Department of Defense	Ethanol Producers
Medical device developers	Refineries
Pharmaceutical compound developers	

FTIR Fundamentals

FTIR analysts can simultaneously identify and quantify both organic and inorganic compounds in complex gaseous mixtures by measuring the unique infrared absorbance of each molecular structure in the gas-phase. The resulting absorbance spectra are then compared to reference (laboratory) spectra for identification or to quantify specific compounds of interest. The only molecular species that do not exhibit such infrared absorption patterns are the homonuclear diatomics (e.g. N₂, O₂, F₂, and Cl₂).



Enthalpy's FTIR Program Manager

GRANT PLUMMER (Ph.D. Physics) is a leading authority in the field with expertise in applying FTIR spectroscopy to emissions testing and environmental issues. Dr. Plummer is a hands-on member of our team who oversees Enthalpy's FTIR spectroscopy efforts from training and research to participating in field tests. Dr. Plummer has contributed to the fields of low-temperature physics, submillimeter-wave molecular spectroscopy, radio astronomy, infrared spectrometry, remote sensing, and synchrotron-based x-ray spectroscopy.

He co-authored the three EPA FTIR-based methods, wrote EPA's "FTIR Protocol," NIOSH's Method 3800, developed EPA's calibration transfer and dynamic spiking techniques, and has performed numerous FTIR research projects for government, industry, and venture capital groups. Dr. Plummer also holds a U.S. Patent for "stand-off" infrared sensors.

More than just a matter of running a test on the right equipment, FTIR is serious science. Get it done by serious scientists. Contact us to learn more about this versatile technology.

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