

# KAIZEN ENVIRONEWS

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## ISOKINETIC SOURCE SAMPLING (STACK EMISSIONS SAMPLING)



Webster's dictionary defines iso as denoting equality, similarity, uniformity. Kinetic is defined as, pertaining to, or due to motion. Isokinetic sampling is an equal or uniform sampling of particles and gases in motion within the stack.

Isokinetic source sampling is achieved when the velocity of gas entering the sampling nozzle is exactly equal to the velocity of the approaching gas stream. This provides a uniform, unbiased sample of the pollutants being emitted by the source.

Isokinetic source sampling most closely evaluates and defines various parameters in the stack, as they actually exist at the time of sampling. Preliminary measurements are made in order to determine the appropriate sized nozzle for isokinetic sampling across the velocity profile of the stack. Minor adjustments required to maintain an isokinetic condition at each test point are accomplished by regulating the sample flow rate.

## WHY CONDUCT EMISSIONS TESTING?

There are several reasons for obtaining source emission data on the type and amounts of materials being emitted from industrial stacks:

- to determine if a process unit is in compliance with existing or proposed emission regulations;
- to ascertain the economics of materials or product losses from a source;
- to obtain relevant data which can facilitate the selection and design of control equipment;
- to test the efficiency of installed control equipment;
- to allow control of a process by continuous or frequent observation of one or more constituents in the stack gas stream;
- to provide more accurate data to develop air resources management programs, control regulations and inventories;
- to calibrate continuous monitors

### QUOTE!!!

*There's so much pollution in the air now that if it weren't for our lungs there'd be no place to put it all!*

*Robert Orben*

## WHAT IS EMISSIONS TESTING?

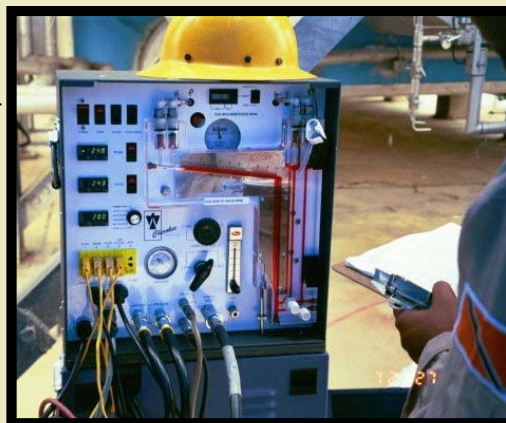


Emissions Testing (a.k.a., Stack Sampling or Stack Monitoring, etc.) is the experimental process for evaluating the characteristics of industrial waste gas stream emissions into the atmosphere. Materials emitted to the air from these sources can be solid, liquid, or gas; organic or inorganic.

The effluent pollutants emitted to the atmosphere from a source may contain many different pollutant materials. Effluent measurements and sampling procedures follow specific test methods and protocols to ensure representative and accurate emission data. Test methods are pollutant specific, sometimes industry specific and originate from a variety of sources and jurisdictions such as United States Environmental Protection Agency (US EPA) etc.

Kaizen Environmental Services (Trinidad) Limited refers to reference test methods published by the US EPA in Code of Federal Regulations (CFR) Title 40 Part 60: *Protection of Environment - Standards of Performance for New Stationary Sources, Appendix A*. These methods outline the basic protocols for determining particulate concentrations and mass emission rates.

Source sampling provides a great deal of important data on the operating parameters and emissions of an industrial source. This information is used as the basis for decisions on a variety of issues. The data taken during a source test experiment must therefore be a precise representation of the source emissions. This task requires a thorough knowledge of the recommended sampling procedure in conjunction with an understanding of process operations. The typical industrial process may vary conditions at the source for a variety of economic or logistical reasons.



The source sampling program must be designed to prevent process variation from biasing the source sample and to ensure the safety of the field personnel. Consequently, source testing is an endeavor that should be performed by trained personnel only.

## KAIZEN STACK EMISSIONS TESTING

The **PROJECTServices** Division of **Kaizen** executes environmental consulting and contracting in the form of project works. The division has three service sections one of which is **Measurement**. This section offers a wide range of testing & monitoring services which include the following:

- **Stack Emissions Testing**
- Indoor Air Quality Testing
- Ambient Air Testing
- Noise Monitoring
- Industrial Hygiene / Occupational Testing
- Radiation Testing / NORM Monitoring
- Marine Sediment Testing
- Effluent and Waste Water Testing
- Soil Sampling

The **PROJECTServices** air quality service includes a 24-hr Call-Out / Rapid Response and continuous monitoring service for toxic, organic/inorganic gases and particulates **352-0121**. A **PROJECTServices** representative would be delighted to come visit you to further discuss these services and assist in providing the solution to any of your needs. Additional information can also be sourced at [www.kaizen-tt.com](http://www.kaizen-tt.com).

The following are some of the equipment used by the **PROJECTServices** Division for stack emission testing:

### Method 5 Sampling Train



The Method 5 Sampling Train is suited to perform isokinetic particulate testing as well as volumetric flow rate, determination of a gas stream, avg. velocity and determination of the moisture content of stack gases. Due to the non-standardized design of stacks and testing locations, arrangements of stack testing equipment is often a difficult task. In the flexible arrangement, this convertible system enables the tester to easily and efficiently set up for these challenging environments, such as vertical traverses and space limited areas. Other pollutants can be collected in the impinger portion of the system providing the proper reagent is utilized.

### Testo 350XL Combustion Analyser

The Testo analyser is a flexible, portable measuring system which fulfills a wide range of requirements. It consists of a control unit, analysis box and a flue gas probe. O<sub>2</sub>, CO, NO (option) NO<sub>2</sub>, SO<sub>2</sub>, C<sub>x</sub>H<sub>y</sub>, H<sub>2</sub>S, temperature and differential pressure are measured. The detachable control unit can also be used as a separate analyser for temperature, velocity, differential pressure, relative humidity etc. The readings can be printed on the integrated printer. A complete Peltier gas preparation unit for controlled condensate disposal is built into the analysis box.



## YOUNG LEADERS!!

Kaizen visited Carapichaima West Secondary School to assist the RBTT Young Leaders with their Display for Earth Day to promote sustainable development. The event was a major segment of their public awareness campaign in combating environmental degradation.

Additionally, Kaizen also presented to the Carapichaima East Secondary School on Environmental Sustainability and the important role each individual plays in achieving this.



## HSE EVENTS!!

Kaizen also participated with their Corporate partners in supporting their HSE initiatives.



Carib Brewery HSE Week



TSTT Safety Month



Lake Asphalt HSE Week



Carillion 1000,000 Man Hrs

## WE'VE RELOCATED!!!

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[www.kaizen-tt.com](http://www.kaizen-tt.com)

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