



TEKTRAN[®]
Instruments Corporation
a TSI company

Where Measurement Begins



Ultra Sensitive Measurement
< 0.1 ng/m³ (5 min samples)

Tekran[®] Series 3300Xi

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Tekran® 3300Xi HgCEM System

USA Mercury Regulation Activity

The EPA Electric Generating Unit Mercury and Air Toxics Standards (EGU MATS) and Portland Cement Maximum Achievable Control Technology (PC MACT) regulations require reductions in gaseous mercury emissions. Tekran has proven technology to support mercury compliance monitoring, abatement system optimization, and performance audit testing instrumentation.

Air Pollution Control Equipment: Performance Guarantees and Acceptance Testing

Architect engineers, consultants, and end users are seeking validation of mercury abatement technologies including, but not limited to:

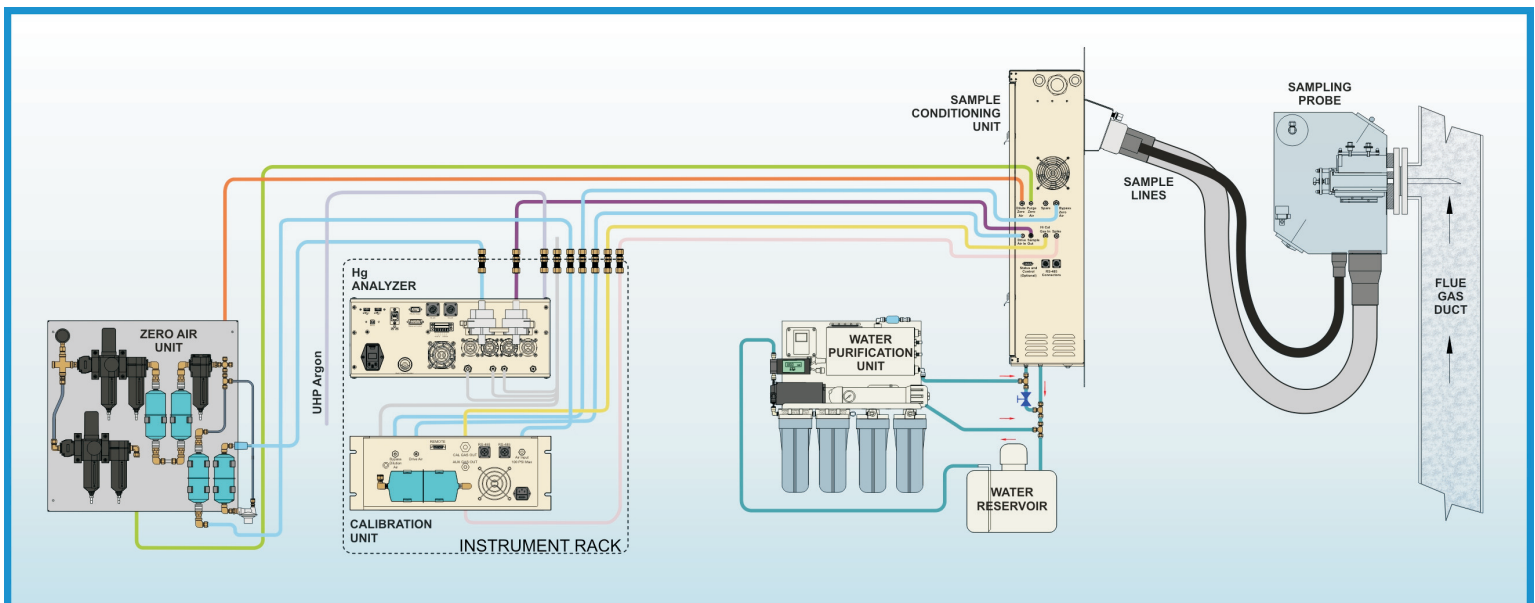
- Pre-combustion chemical additives
- Post-combustion treatment
- Mercury oxidizing technologies
- Wet scrubber additives
- Custom mist eliminators

Current specifications requiring performance guarantees face difficulties due to:

- Inlet/outlet conditions that are ill-defined
- Sorbent trap systems may over estimate gaseous Hg

Tekran is the only company to provide all the following:

- ✓ Ten years of HgCEM system design, manufacture, service, and support
- ✓ Multi-point HgCEM sampling technology for inlet/outlet testing
- ✓ NIST Traceability – Tekran 3310Xi low and high level generators used by NIST
- ✓ Low-level measurements certifications of accuracy (EPRI, EERC, CATM, ICCI)
- ✓ Service personnel averaging 10,000 hours of field and laboratory experience
- ✓ Parts, training, and support by phone, email and remote access



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New Generation - Tekran® Model 2537Xi



Electronics Platform

- Network enabled
- Touch screen interface
- Local data storage and front panel USB port
- Remote access (troubleshooting, control and configuration)
- Improved data and instrument parameter logging
- Additional functionality via optional s/w plugins (std. additions, remote valve control, and much more)

Detector

- New lamp stabilizer and detector electronics
- Easy cuvette removal via convenient fitting interface
- Improved stability and sensitivity
- Digital PMT control and display

Permeation Source

- Lower dead volume permeation chamber
- Digital permeation source set point and display
- Improved accessibility

Cartridge / Valve Assembly

- New low dead volume valve assembly
- Constant power heater control
- Faster cartridge cool down with individual high-velocity fans

Physical Layout

- Reduced height from 5U (8.75") to 4U (7")
- Improved component accessibility for routine maintenance

100% Compatible with prior 2537 units and 3300 systems

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New Generation - Tekran® Model 3310Xi



The Tekran Model 3310Xi Elemental Mercury Calibrator allows high-level mercury monitoring systems to be accurately calibrated using elemental mercury. It integrates seamlessly with the Tekran Series 3300Xi speciating HgCEM, and can also be used as a stand-alone mercury calibration system. The calibration source allows both multi-point calibrations and standard additions to be initiated automatically. The unit generates precise mercury additions using a NIST-traceable, temperature controlled, saturated mercury vapor source. Precision mass flow controllers are used to dilute the output of this source to the desired value. The unit is capable of continuously generating large flow rates of calibration gas at virtually no ongoing cost - unlike expensive mercury calibration gas cylinders.

The Model 3310Xi incorporates technology originally developed for the Model 2505 Manual Calibration Unit. Unlike other saturated sources, the Model 3310Xi contains a host of advanced features that provide superior accuracy and allow unattended, remote operation.

Product Highlights

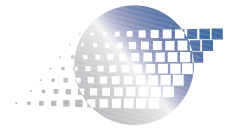
- Output concentration range: 0.5 - 1900 $\mu\text{g}/\text{m}^3$ *
- Calibration gas delivery rate: 2 - 30 SLPM *
- Mercury source will last for many years
- Allowable ambient temp: +5 to +40 °C
- Hg source control range: +5.00 to +50.00¹ °C
- Independent linearization tables for each MFC

Applications

- Coal fired power plants
- Waste incinerators
- Other industrial sources
- Speciation studies
- Bench scale testing
- Mercury removal process monitoring

* Standard Unit. Other working ranges are available. Not all output flow/concentration combinations are available simultaneously. Contact Tekran for details.

¹ Other temperature ranges available.



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Cabinet-Sized, Turn-Key HgCEM System

With a decade of successful mercury emissions monitoring supply and service expertise, Tekran is ready to support you with our proven 3300Xi HgCEM System technology! We have developed flexibility and mobility into our new Turn-Key HgCEM. The system may be deployed in any number of applications including at the stack platform, near a control testing duct or in a process research facility.

The Turn-Key HgCEM offers substantial savings on heated umbilical and control lines, achieved through close-coupling of the HgCEM sample probe, calibration and analysis system. The cabinet-sized 3300Xi HgCEM is a fully functional, self-contained, and environmentally controlled shelter. Tekran offers the most accurate mercury measurement devices on the market, as well as the best service and customer support in the business.



Tekran Has The Solution!

Whether your application is . . .

- Electric Generating Unit Mercury Emissions Monitoring
- Portland Cement Mercury Emissions Monitoring (PC MACT)
- Industrial Mercury Emissions Monitoring (e.g. Steel, Incineration, Taconite, etc.)
- Mercury Control Systems Performance Evaluations and Research

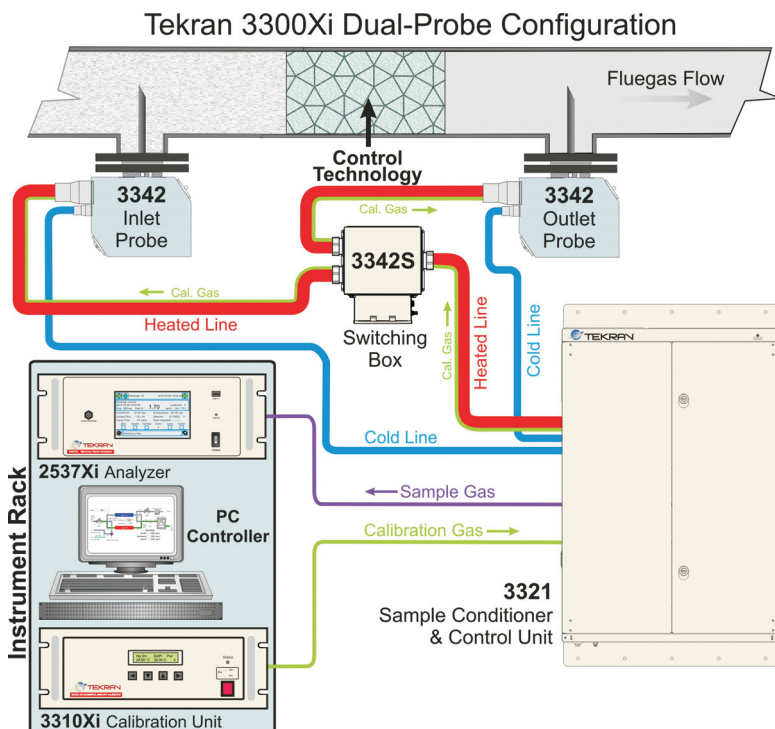


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Tekran[®] Model 3321 Wall Mounted Sample Conditioner

The New Tekran 3300Xi has the same proven components of the successful Tekran 3300. The Tekran 3300Xi is modular, simpler to install and maintain, includes the new Tekran 2537Xi detector and is operated with updated CEM+ software (Tekran 3321 pictured). The 3300Xi is the ideal platform for inlet-outlet control technology optimization, regulatory monitoring of mercury emissions and bench-scale laboratory research. The Tekran 3300Xi can be configured for determination of total mercury only, or for determination of mercury speciation (elemental mercury, oxidized mercury, and total mercury).



Tekran 3300Xi Dual-Probe HgCEM Configuration

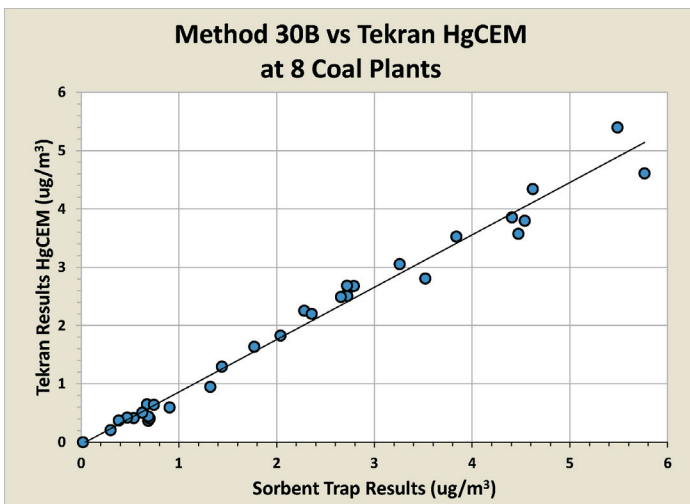
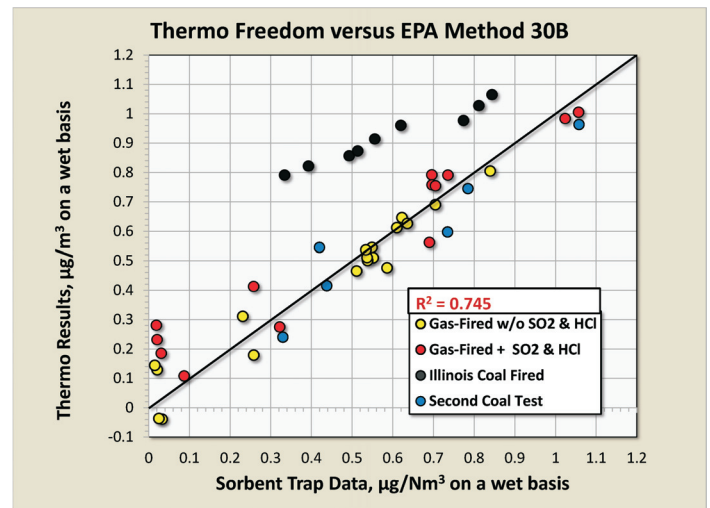
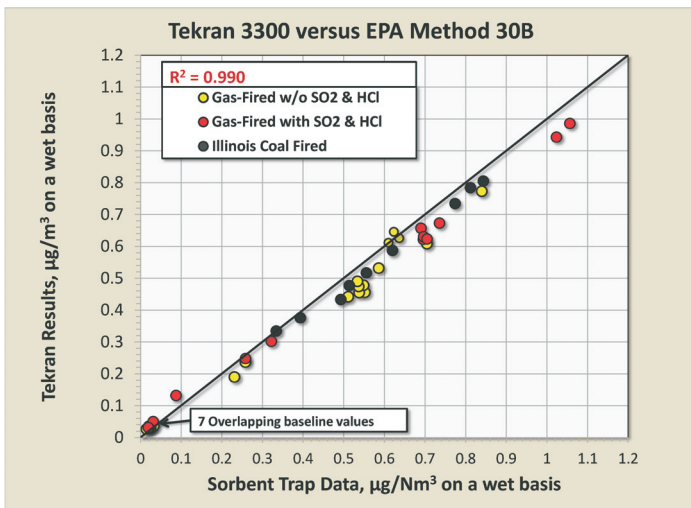
Tekran is your trusted and proven source for accurate and cost-effective Hg control technology testing. Tekran has supported numerous partners with the supply of accurate flue-gas mercury speciation measurement systems. Tekran HgCEM Systems have been used by research engineers to aid in the development and evaluation of:

- Activated carbon injection (ACI) products
- Catalysts used to oxidize and enhance mercury capture
- Polymer composites designed for absorption of mercury
- Chemical additives to enhance mercury removal
- Emission source baseline profiles necessary for compliance planning

Tekran[®] Model 3300Xi Performance

Low-Level Accuracy Study

An independent United States research organization with funding from industry and government agencies tested the performance of commercially available HgCEM systems when measuring coal flue gas at sub-microgram concentrations (range=0.02-1.06 $\mu\text{g}/\text{m}^3$). This reflects the projected mercury concentrations in a MACT regulatory environment, where 90% to 95% reductions from existing levels will be required. This study showed, once again, that the Tekran Series 3300Xi is the most reliable, precise, and accurate HgCEM technology available today. The below graphs show performance comparisons between the Tekran and our primary competitor. Only the Tekran 3300Xi was able to show linear and unbiased agreement over the entire range of concentrations tested.



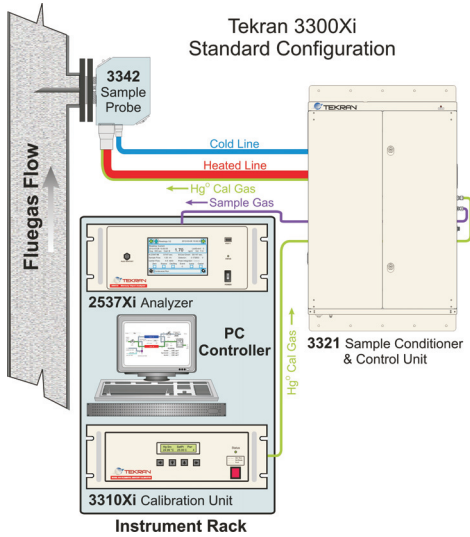
Assessment of instrument performance is a critical component of overall data quality. The Relative Accuracy Test Audit (RATA) uses EPA reference Method 30B to assess Hg stack concentration in order to assure the HgCEM results are accurate. Over a wide range of concentrations, especially in the low range of measurement, the Tekran 3300Xi demonstrates excellent agreement with the EPA Method 30B. This excellent comparability is not affected by installed control technology or coal type. The left graph depicts actual RATA test data from 8 separate plants with a mix of control technology and combustion fuel.



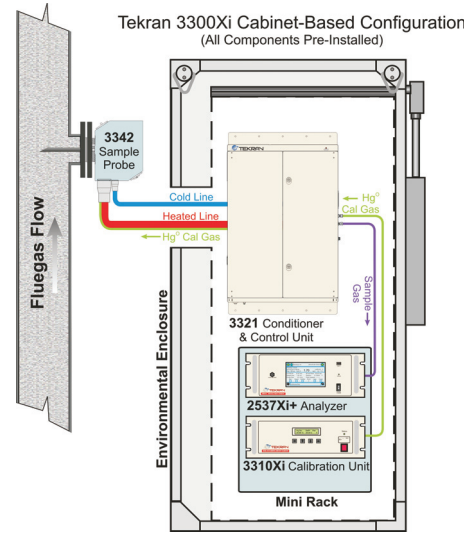
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Tekran[®] Model 3300Xi Configuration Options



Tekran 3300Xi
Standard Configuration



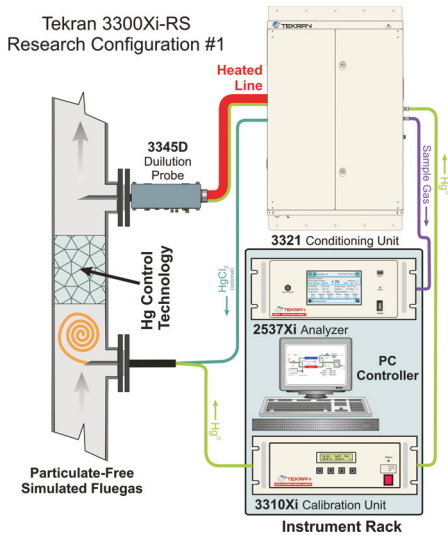
Tekran 3300Xi Cabinet-Based Configuration
(All Components Pre-Installed)

Standard Configuration

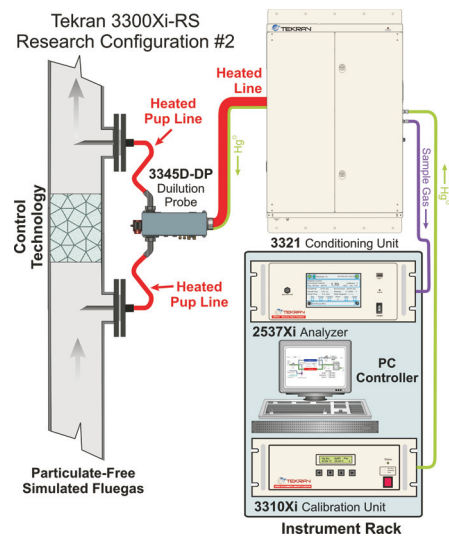
The Tekran 3300Xi was designed as an integrated system for mercury continuous emission monitoring (HgCEM) of regulated point sources. The primary components are housed in a controlled enclosure either at ground level or at the stack. A heated line extends to Model 3342 Probe located at the stack sampling point. The Tekran PC Controller provides continuous operation, periodic calibrations and data reporting.

Cabinet-Based Configuration

Customers desiring a fully integrated solution now have the option of the Tekran 3300Xi Cabinet-Based System. Designed for flexibility, the turn key system comes fully installed in a compact climate-controlled enclosure. The small footprint enables the shelter to be installed in a variety of locations such as the stack platform, near a testing duct, or in the process research laboratory.



Tekran 3300Xi-RS
Research Configuration #1



Tekran 3300Xi-RS
Research Configuration #2

Research Configuration #1

The Tekran R&D team designed the Tekran 3300Xi-RS to accommodate multiple configurations for mercury control technology research programs. Scientists have learned high quality measurements in simulated flue gas are vital for the evaluation and commercialization of mercury abatement technology. For research studies, the modularity of the Tekran 3321 Conditioner and Control Unit easily accommodates a scaled-down version of our full HgCEM system.

Research Configuration #2

Many Tekran 3300Xi-RS systems have been deployed for research purposes. In fact, the US EPA selected Tekran as their supplier of 3 complete HgCEM systems for their mercury flue gas research. Depending on the research needs and goals, the Tekran 3300Xi-RS can easily be customized. For example, the Tekran 3345D-DP Dilution Probe is chosen for research applications because of its ability sample two independent ports.