

Accurately Monitor Mercury-Sulfur-Nitrogen Compounds

Siltek®/Sulfinert® Treatment Prevents Adsorption of Mercury, Sulfur Oxides, or Nitrous Oxides in Emission Monitoring Equipment

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- Improved analytical reliability and sensitivity for mercury, SO_x, or NO_x compounds.
- Protection from corrosion—longer component lifetime.
- Apply to new or existing equipment.

The United States Environmental Protection Agency (US EPA) is actively developing regulations, limits, and control measures for monitoring and controlling mercury emissions from coal-fired power generators—one of the major sources of mercury emissions into the environment.¹ As these regulations and guidelines are developed and implemented, proper equipment will be needed for accurate sampling and analysis. Testing costs for mercury can be substantial (Table 1)², so inaccurate analyses can have financial as well as environmental repercussions.

In flue streams from coal-fired power generators, mercury exists in three forms: elemental, the +2 oxidation state (Hg⁺⁺), and attached to particulate matter. Hg⁺⁺ often reacts with sulfur compounds, nitrogen, chlorine, and/or oxygen, to produce sulfurous, nitrous, chloride, and oxide mercury species. Elemental and oxidized mercury can easily be lost to reactions and adsorption on the inner surfaces of monitoring equipment. In order to accurately sample and quantify mercury in all forms, it is important to use inert sample pathways. Laboratory testing and field results have proven that Sulfinert® treated sampling and testing equipment is essentially inert to active molecules³, including mercury.

Siltek®/Sulfinert® treatment can be applied to many of the components in a mercury sampling stream, including probe tubing, impingers, fittings, filters, housings, and transfer tubing (Figure 1). Treating all of the components of a stack or continuous emission monitoring system will greatly improve analytical reliability and sensitivity, which will be needed as regulations are brought on line and emission quotas are enforced. Fast and accurate testing, without re-work, can save a great deal of time and money.

Similarly, a Siltek®/Sulfinert® treated sampling system will improve the reliability of data for sulfurous oxides and nitrous oxides (SO_x and NO_x). As with mercury, it is difficult to reliably transfer these compounds through untreated sampling equipment.

In addition to preventing adsorption of reactive compounds, Siltek®/Sulfinert® treatment will act as a barrier, protecting and prolonging the lifetime of treated equipment. The durable layer will withstand temperatures to 400°C.

We offer Siltek®/Sulfinert® treated tubing, sample cylinders, and other components from stock; to discuss custom treatment of system components, please contact the Restek Performance Coatings team.

Restek offers treated and untreated tubing, fittings, and valves, passive air sampling kits, air sampling canisters and miniature air canisters, sample loops, and more. For more information, request our catalog or visit us online. www.restekcoatings.com

Figure 1 Highlighted components of a mercury sampling train,⁴ and all tubing in the system, can be Siltek®/Sulfinert® treated.

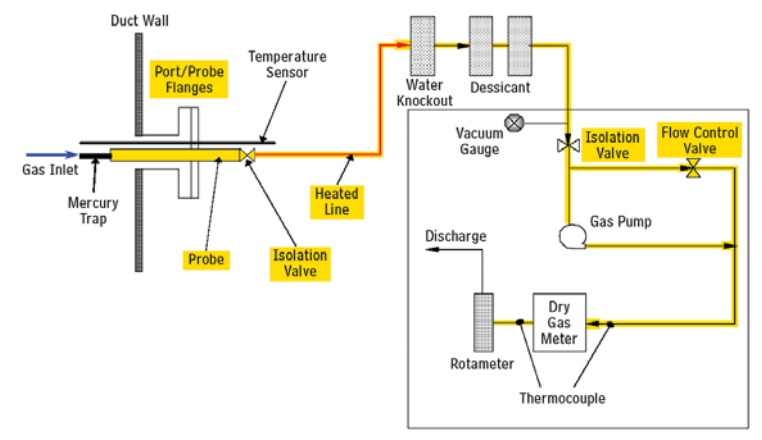


Table 1 Typical costs of mercury sampling (U.S.).²

Method	Approx. Cost of Analysis
US EPA 29	
US EPA 101A	
ASTM D6784-02	
US EPA 324	
FAMS	

References

1. Pottinger, M., S. Stecklow, and J.J. Fialka, *Invisible Export, A Hidden Cost of China's Growth: Mercury Migration* The Wall Street Journal Online, Dec. 17, 2004.
2. Serne, J.C., *An Overview and Comparison of Available Mercury Emission Test Methods for Boilers* Symposium on Air Quality Measurement; Methods and Technology 2005, San Francisco, CA; Air & Waste Management Association. paper no. 439, pg. 9.
3. Barone, G., M. Higgins, D. Smith, S. Rowan, W.J. Gross, and P. Harris, *The Surface for Sulfurs* Hydrocarbon Engineering, Dec. 2004, pp 47-50.
4. Proposed Method 324. *Determination of Vapor Phase Flue Gas Mercury Emissions from Stationary Sources Using Dry Sorbent Trap Sampling* United States Environmental Protection Agency. Washington, D.C. p. 5.

