



GORE™ Mercury and SO₂ Control System

FOR INCINERATION

Simple, Cost Effective Mercury and SO₂ Control

Reduction of Mercury and SO₂ Emissions

Sewage sludge, municipal solid waste, and hazardous waste incinerators around the world are under continual regulatory pressure to reduce emissions of various pollutants. Many countries have or are proposing new regulations limiting mercury emissions requiring plants to re-evaluate their control strategies to include mercury. Activated carbon injection and fixed carbon beds are two commonly accepted technologies to control mercury. Each have their benefits and limitations and selecting the best solution will depend on the site specific situation. Now there is a proven alternative that eliminates those limitations.

Multi-Pollutant Control System

The GORE™ Mercury & SO₂ (GMS) Control System is a unique fixed catalyst and sorbent system for removing gas phase mercury and SO₂ from incineration flue gas. The system is based on discrete stackable modules that utilize an open channel design which results in very low pressure drop. If space allows, modules can be installed in the outlet portion of an existing wet scrubber, for a zero-footprint, tailpipe solution. Small footprint, post scrubber options are available for situations where scrubber space is limited. Operation is passive; the modules will continuously chemically adsorb mercury and convert SO₂ to liquid sulfuric acid without requiring any adjustment, regeneration, or replacement. The system is completely scalable – modules can be stacked in the direction of the gas flow to achieve desired mercury and SO₂ removal efficiency. This approach preserves ash properties and avoids the additional cost and space required by fixed carbon beds.

The Science Behind the Solution

At the heart of the technology is an innovative, fluoropolymer-based material developed by scientists at W. L. Gore & Associates: Sorbent Polymer Catalyst (SPC) composite material.

The sorbent in the SPC material efficiently captures both elemental and oxidized mercury, where it is securely bound within the SPC via chemisorption. Since there are no injected sorbents or chemicals, there is no concern over ash contamination or creating additional particulate matter that needs to be collected.

SO₂ in the flue gas is catalytically converted to liquid sulfuric acid which is expelled out of the hydrophobic SPC material as large droplets. The dilute acid is collected and neutralized within the scrubber.

Low Capital Cost vs. Carbon Beds

- Zero and small footprint installation approaches
- No gas conditioning required after scrubber

Low Operating Cost

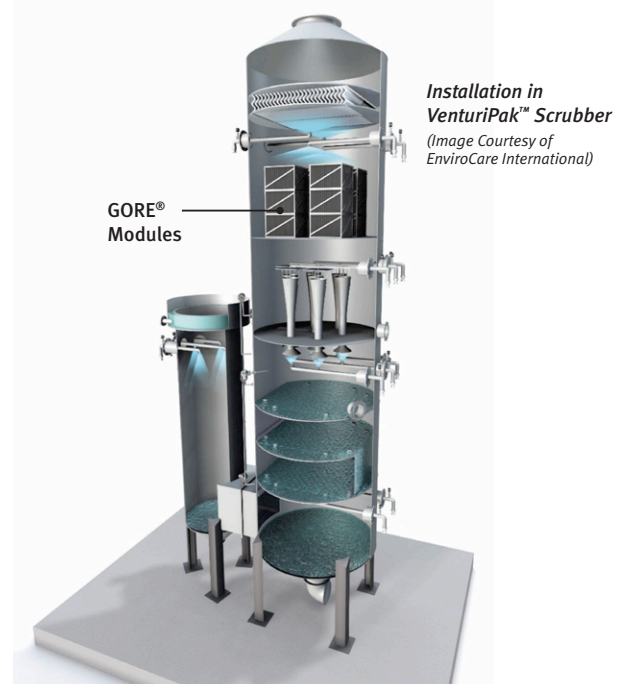
- Long module lifetime
- No maintenance or adjustments needed
- Low pressure drop

Low Process Impact

- No injection of activated carbon or chemicals
- No impact on ash properties
- No impact on waste water treatment system

SO₂ Removal Co-Benefit

- Further savings from reduced caustic use





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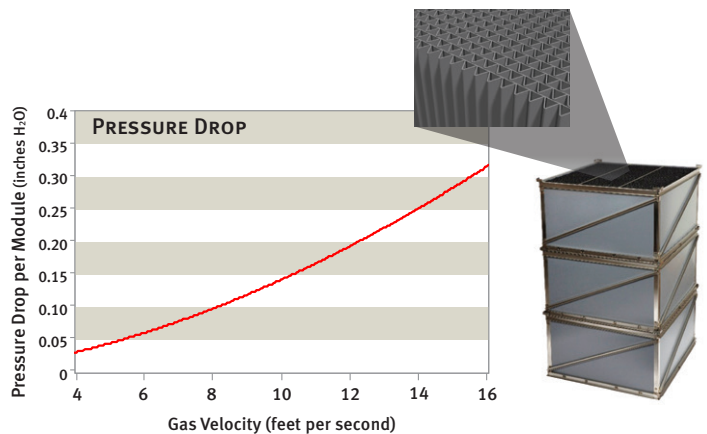
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The SPC is designed to function in high humidity (wet) acidic gas streams, making it ideal for location above the mist eliminators in a wet FGD (flue gas desulfurization) or venturi scrubber system. Both in-scrubber and post-scrubber installation approaches have been commissioned at sewage sludge incinerators.

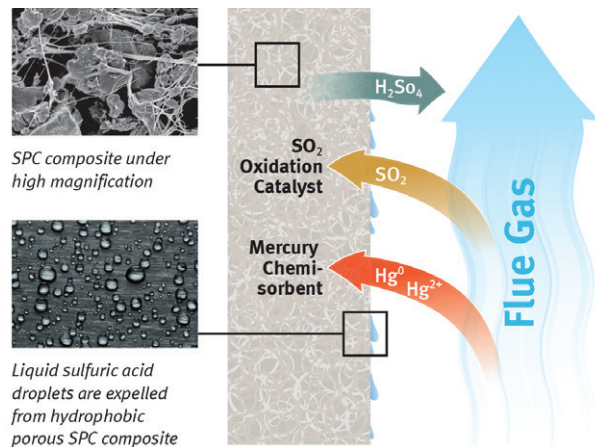
Operation of the GMS Modules is exceedingly simple. Since the modules contain no moving parts, there is no need for any adjustments to maintain performance as unit operations change. The modules are resistant to fouling or plugging, in part due to the smooth, nonstick nature of the SPC, and in part due to the continual acid wash created by the conversion of SO₂ to liquid sulfuric acid. A simple water rinse system is installed above and below the modules and periodically operated to help rinse acid and dust off the module surfaces. The low pressure drop of the system, long module life, and lack of continuous injection of carbon or chemicals result in a low operating cost.

Installation Experience

GMS Modules have been installed in over 2100 MW of coal-fired power plant capacity over the past few years, as well as over 15 waste incineration plants. Modules have been piloted in the field in numerous other applications requiring control of mercury, SO₂ or both, demonstrating the ability to function in a wide variety of flue gas compositions.



The unique open channel structure of the GORE® Module provides extremely low pressure drop.



The SPC composite captures and sequesters elemental and oxidized mercury while converting SO₂ to liquid sulfuric acid.



Stand-alone GMCS Installed After Scrubber at Sewage Sludge Incineration Facility
(Photo Courtesy of EnviroCare International)

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