GORE® SO_2 Control System
For Coal-Fired Boilers

SPC modules being installed in a coal-fired power plant.

NO REAGENT, SMALL FOOTPRINT, SIMPLE OPERATION, LOW OPERATING COST

Reduction SO_2 Emissions

Coal fired power plants in India are under regulatory pressure to reduce emissions of SO_2, among other pollutants. In choosing flue gas desulfurization (FGD) solutions, plants must consider factors such as reagent cost, availability and handling, site space constraints, auxiliary power consumption, reaction by-product disposal, fly ash preservation, and required outage time, in addition to overall cost and complexity to operate.

Reagent-less Control System

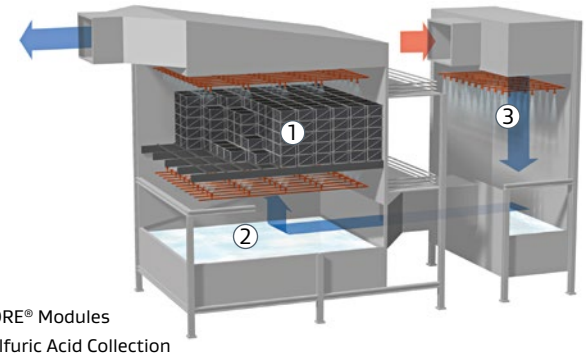
The GORE SO_2 Control System allows plants to comply with the new SO_2 emissions standards without requiring any reagent. The system utilizes fixed catalysts to convert SO_2 into dilute sulfuric acid, which is subsequently concentrated into a saleable grade. This means there are no reagent supply logistics to worry about, no need for reagent handling, storage and preparation operations, no reagent price volatility concerns, or any solid waste disposal considerations. An alternative is to introduce a neutralization system, converting the sulfuric acid into a saleable gypsum byproduct. The GORE SO_2 Control System has footprint and layout advantages relative to wet or semi-dry flue gas desulfurization systems allowing it to be installed at even highly space-constrained sites with minimal outage time. Operation is passive and simple; the system does not require any adjustments, treatments, or regeneration.

Low Operating Cost

- No reagent required for SO_2 removal
- Low parasitic power consumption
- Saleable sulfuric acid by-product
- Simple operation
- Lower water consumption

Low Process Impact

- Small, flexible footprint
- No impact on fly ash quality
- Additional PM reduction
- Low pressure drop
- No additional CO_2 generation



① GORE® Modules
② Sulfuric Acid Collection
③ Water quench (cool and humidify)

GORE SO_2 Control System including water quench, catalytic modules and acid collection.

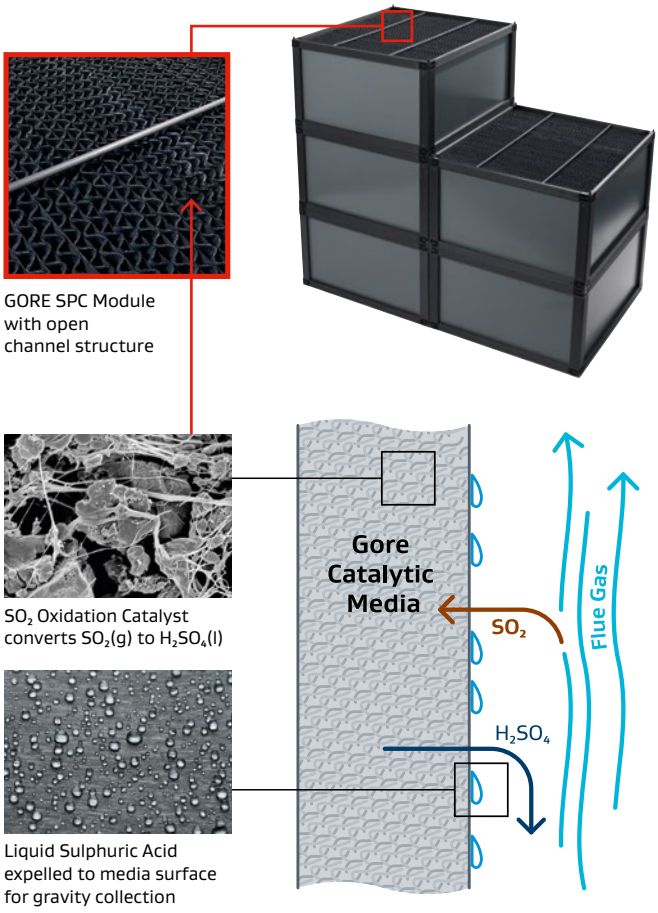
Together, improving life

The Science Behind the Solution

At the heart of the technology is an innovative fluoropolymer-based material developed at W. L. Gore & Associates: Sorbent Polymer Catalyst (SPC) composite material. SO_2 in the flue gas is catalytically converted to liquid sulfuric acid which is expelled out of the SPC composite material as large droplets. The sorbent in the SPC material also captures gas-phase mercury, providing an additional co-benefit.

SPC material is configured into open-channel low pressure drop discrete modules which are stacked in layers according to the level of SO_2 removal needed. If higher removal is required in the future to meet a lower limit, additional modules can easily be added to the system.

Flue gas is first quenched with water to saturation and is then directed through a vessel containing the SPC modules. The reaction between SO_2, O_2 and H_2O forms dilute H_2O_4 without forming CO_2. This acid is collected at the base of the vessel, filtered, and piped to storage tanks. From there, the sulfuric acid may be concentrated in an acid concentration system using low grade steam from the power plant. This allows the byproduct acid to be sold into the local sulfuric acid market for uses such as SSP fertilizer production. A large amount of water is recovered in the acid concentration process, resulting in significantly lower water usage than a wet flue gas desulfurization system.



Installation Experience

GORE SO_2 Control Modules have been installed in over 2200 MW of coal-fired power plant capacity, as well as over 18 waste incineration plants. A full-scale system is currently being installed at one of Hindalco's captive power plants, with start-up scheduled next year.

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