

A photograph of a large industrial facility, likely a gas treatment plant. The image shows several large, cylindrical metal vessels (reactors or absorbers) arranged in a row, supported by a complex network of steel beams and walkways. The lighting is warm and industrial, highlighting the metallic surfaces and the intricate piping. The overall scene conveys a sense of scale and advanced engineering.

Gas
Treatment
System

Semi Dry / Gas Suspension Absorber (GSA)

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In a Gas Suspension Absorber(GSA) system, fresh alkali sorbent is injected into the flue gas stream to react with acid gases present in vaporous form contained within the particulate contaminated flue gas. The reactor chamber actively encourages the mixing of the agents in a turbulent zone. The resultant interaction of the alkali sorbents with the vaporous acid gases produces a highly efficient de-acidification reaction of SO_x, HF and HCL, with the formation of salts as the product. The dust concentration inside the GSA system reactor is typically 50 to 100 times higher compared to conventional reactors, providing a high stoichiometric ratio of alkali to acid.

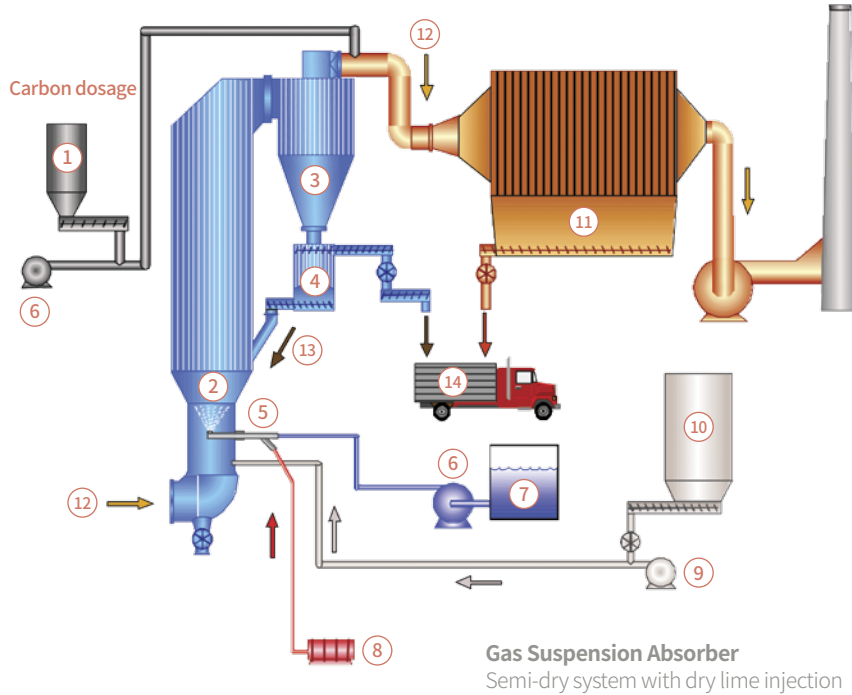
The next step is the cyclone, where most of the dust is removed. Dust is completely removed by the ESP or Bag Filter later in the process so that only clean air is released into the atmosphere.

The reaction products and dust captured in the cyclone are recycled to the reactor and used as an absorbent. This means lower operating costs due to the reuse of alkaline chemicals. The GSA system can be run at minimal cost according to the target discharge rate if it is linked up to an acid gas monitoring system.

Advantages

- Short installation period due to flexible module design
- Small area required and no wastewater generated
- Low maintenance/repair cost
- Operating cost savings due to reuse of chemicals
- High removal efficiency

1. Active carbon silo
2. Reactor
3. Cyclone
4. Re circulation box
5. Nozzle lance
6. Pump or blower
7. Water tank
8. Air compressor
9. Blower
10. Lime silo
11. ESP or FF filter
12. Flue gas
13. Re-circulated sorbent
14. By-product



References

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Saemangeum Thermal Power Plant



Hyundai Oilbank



Chongqing Nine Dragons Paper