

APATech™ FGD System

- A New Technology Break-through for FGD -

APA Environmental

APA Environmental Pty Limited (APA Environmental) is a sub-sidiary of APA International Pty. Limited. APA International Pty. Limited has expanded to environmental protection, engineering, education, investment and international trade since it was established.

APA Environmental is the leader in the field of research & development, design, engineering and management of air pollution control and waste management, in particular flue gas desulphurisation (FGD) and electrostatic precipitator (ESP).

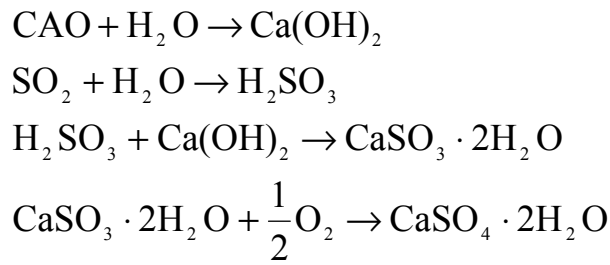
Recently, our scientists and engineers have improved our new APATech™ FGD System on the basis of modern technology, principles of aerodynamics, our wide-ranging industrial experiences and the latest research findings.

This technological innovation will provide a much better solution for the FGD in the majority of coal-burning power plants.

Basic Principles of FGD

Wet FGD is the process of removing sulphur oxides, primarily SO₂ from combustion gases. In wet process FGD Systems, flue gases are in contact with an absorbent in the vessel called either an absorber or a scrubber. The SO₂ reacts with the absorbent or dissolves into the solution to produce slurry or liquid that contains dissolved or solidified sulphur compounds.

Amongst the wet FGD system used in industries, the lime and limestone scrubbing are most commonly used. The fundamental theory describing lime-scrubbing processes is:



Technology Key of FGD System

One of the major processes of FGD system is that lime/limestone slurry absorbs SO_2 , then it is oxidized by air blowing at the lower part of the absorber tower to produce calcium sulphate. Based on this process the total surface of lime droplets plays a significant role in absorbing SO_2 . It is obvious that the larger the total surface area of produced droplets with the same amount of lime slurry, the higher the absorbing efficiency of SO_2 as the interface between SO_2 and the slurry greatly enlarges.

Another technological innovation of FGD system is the degree of the turbulence of flue gas through the absorber tower. The less turbulence, the greater efficiency of SO_2 removal will be achieved.

APATech™ FGD System

Our new De-SO_x/Dust systems, APATech™ FGD System have been developed with the technological innovation to satisfy the above-mentioned requirements of FGD systems. With our advanced APATech™ FGD systems, rather than droplets with 3 mm in diameter for conventional spraying devices for FGD, we have created a new spraying system which can produce much smaller sized droplets, having 20~400 μm in diameter by varying atomising air pressures, lime slurry liquid flow rate, and spraying nozzle diameters, with a significant amount of charge on droplets. As droplets will have the same polar charges, they repel each other. This will prevent fine droplets from becoming coarse due to collision.

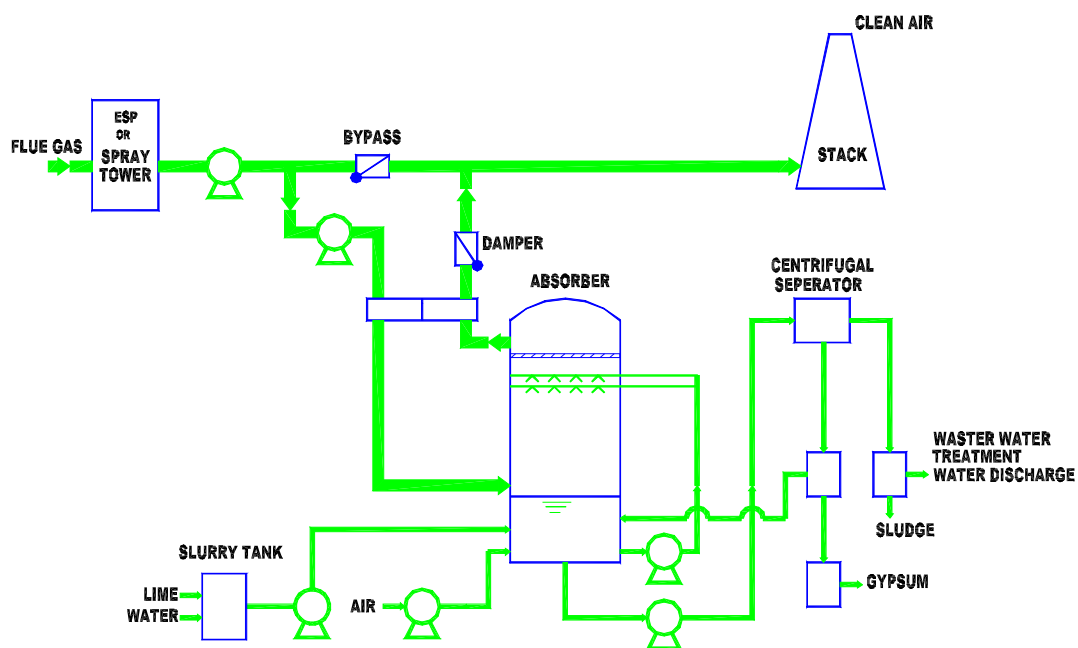
Along with our new spraying system, we have also developed a new type of perforated plates, on the basis of modern aerodynamics, to achieve a better gas condition in the absorbing tower. This reduces the

pressure drops of the tower, and leads to increased efficiency of SO₂ removal.

APATech™ FGD System also allows a higher flue gas velocity in the absorber and adoption of horizontal flow spray absorber instead of conventional vertical flow spray absorber while retaining high removal efficiency. This will dramatically shorten duct length and occupy less land and space. Eventually this will help to accomplish a lower construction cost.

Applying APATech™ FGD System will achieve a higher efficiency of dust and SO₂ removal while lime consumption is significantly reduced. This eventually reduces the initial and operating cost of installing such a system in coal-burning power plants.

APATech™ FGD System also provides a unique solution that solves both SO₂ and dust control problems simultaneously. Therefore, it is an ideal application for power plants whose current dust collection equipments do not meet their demands or newly planned built plants. It will significantly lower the environmental protection cost of those power plants.



Performance

Desulphurisation	Up to 99%
Dust Removal	Up to 99%
Raw Material	Lime
By product	Gypsum

Advantages and Benefits

- APATech™ FGD System is able to remove SO₂ and collect dust simultaneously with up to 99% efficiency. This will resolve two problems at once for those plants whose current dust collection systems do not provide sufficient collection efficiency or newly built coal-burning power plants.
- APATech™ new spraying systems convert the lime slurry into fog and achieve a higher SO₂ removal efficiency of up to 99%.
- Adoption of horizontal flow spray absorber and simplified flue duct make a compact FGD system. This will occupy less land and space and significantly reduce the installation costs of the system.
- Specially designed perforated plates, producing a better flue gas distribution and increasing the absorption efficiency of SO₂.
- Low-pressure drops produced by the system will dramatically reduce the operating cost of the system.
- APATech™ new spraying system reduces the amount of lime consumption by up to 25%. This will significantly reduce operating cost.
- APATech™ FGD Systems can be used to treat large or small gas volumes.

- APATech™ FGD Systems can achieve higher SO₂ removal efficiency of up to 99% with considerable cost savings of up to 30% in comparison with conventional FGD systems.
- By-product Gypsum can be used for board and cement materials.

For more information of this exciting technology, please contact our Engineering Group.