



Further information:

Flue Gas Desulphurisation Plant

Purpose

The Flue Gas Desulphurisation (FGD) plant removes Sulphur Dioxide from the flue gas before it is released into the atmosphere and hence reduces our impact on the environment.

This technology enables Ratcliffe to use British coal. British coal tends to have high sulphur content so burning it causes sulphur dioxide to be released. The FDG technology removes this from emissions.

How does it work?

The FGD technology is based on a chemical reaction that occurs when the warm exhaust gases from the coal-fired boiler come into contact with limestone. This reaction removes 92% of the sulphur dioxide from the flue gas and converts the limestone into Calcium Sulphite.

In practical terms, the flue gas is drawn from the boiler into the FGD ductwork and forced into the absorber tower by a booster fan.

Once inside the absorber tower, the gas comes into contact with a limestone slurry mixture (in keeping with our strict environmental policies E.ON does not use limestone from national parks). The slurry is sprayed from banks of nozzles situated towards the top of the tower.

When the warm gas comes into contact with the limestone slurry a chemical reaction occurs between the Sulphur Dioxide (SO₂) in the gas and the limestone.

This reaction removes the SO₂ from the flue gases and converts the limestone into Calcium Sulphite. This Calcium Sulphite and limestone slurry then falls to the base of the absorber where it is injected with compressed air. The compressed air oxidises the calcium sulphite and converts it to Calcium Sulphate – commonly known as gypsum.

However, that is not all.

Before the flue gas reaches the absorber tower, it passes through a heat exchanger. The purpose of the heat exchanger is to cool the flue gas into the FGD to 90 degrees C.

This heat is then used to reheat the cooled, treated flue gas as it passes back through the heat exchanger where it is reheated to above 80 degrees C to give it the buoyancy required to take it through the chimney.

Before going through the heat exchanger however, the gas will pass through demisters to remove any slurry from the wet gas and prevent blockages through carry over of moisture and gypsum into the outlet gas ducting and subsequently into the heat exchanger.

Additional info

- The Warman heavy duty pumps used to pump the limestone slurry to the top of the absorber towers are the largest of their type in the world and are capable of circulating in excess of 8,000 tonnes of slurry an hour



- The limestone slurry also removes up to 95% of the Hydrogen Chloride present in the flue gas).

Facts and Figures

Size	
Area covered by the FGD plant	12.5 hectares
Absorber tower height	50 metres
Construction materials used	
Concrete/stone	58,500 tonnes
Steel reinforcement	5,000 tonnes
Hardcore /stone filling underneath roads etc	16,000 tonnes
FGD plant steel work	50,000 tonnes
Lining material used	
Total area of rubber lining in absorbers	9,400 m ²
Area of ductwork lined with glass flake vinylester	35,200 m ²
Pipework associated with the plant	
Glass reinforced pipework	10,000 metres
Carbon pipework	8,000 metres
Process parameters	
Weight of gas treated	57,000 tonnes/day
Design SO ₂ efficiency	92%
Typical quantity of SO ₂ removed	155,000 tonnes/annum
Average quantity of limestone used	340,000 tonnes/annum
Average quantity of gypsum produced	480,000 tonnes/annum