

# **PROCESS- DESCRIPTION**

**OXYCOAL-AC-TESTING PLANT  
OF RWTH AACHEN**

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## Oxycoal – AC – testing plant

The RWTH Aachen ordered the engineering office VER Verfahrenstechnik Ingenieure GmbH 2008 with the planning, delivery, construction and commissioning of a complex flue gas recirculation system of a testing combustion chamber.

The Oxycoal-AC-process serves the development of a free CO<sub>2</sub>-emission coal combustion process with high degree of efficiency.

### Process description:

At the combustion chamber lignite dust is burned to get flame investigations. A mixture of oxygen and CO<sub>2</sub> serves as combustion medium. Up to now the combustion air was taken from gas tanks and mixed by a gas mixer. The duty of the recirculation is to replace the CO<sub>2</sub> with recirculated gas.

Further is planned to gain the oxygen from air with a ceramic diaphragm. A branch current of the flue gas is passed through an existing hot-gas strainer.

If required the flue gas can be conducted by the turbo test facility. In this test stand compressor components should be tested at specified temperatures under flue gas conditions.

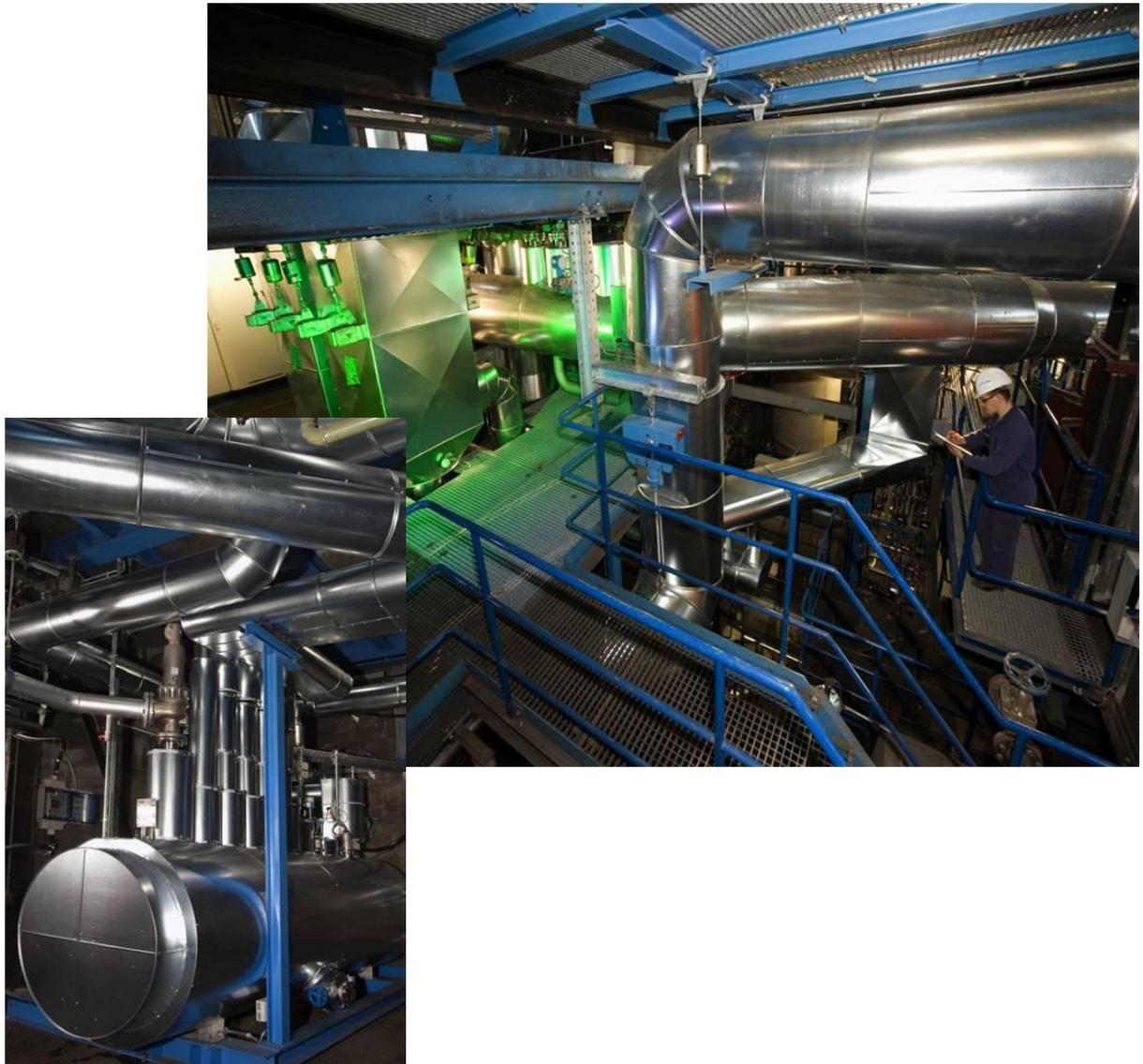
By addition of oxygen from the gas tank, certain O<sub>2</sub> contents can be adjusted. By the air-cooled test stand cooler the flue gas is cooled to 300°C. The controlled bypass of the cooler makes the setting of temperatures between 300 and 850°C possible. The flue gas from the test stand is supplied to the recirculation again.

By addition of oxygen from the gas tank to the recirculated flue gas, the oxygen contents of the burner air can be adjusted from 15 to 25% by volume. In air-cooled flue gas cooler, the recirculated flue gas is cooled before the compressor at temperatures of about 250 degree.

In a flue gas compressor, the flue gas is at max. 1.0 bar over-pressure compressed and sent to the gas storage burner air.

The gas storage of the burner air serves as a buffer to regular and distribution of the burner air. The several burner airs are regulated by the existing air ducts fed to the burner. For starting and preheat of the recirculation must be flue gas drained off.

The high temperatures and special flue gas compound demand high at the design of pipe lines, apparatus and materials.



**Picture A: Oxycoal-AC-testing plant of RWTH Aachen**

Stage of working: March 2012