

Client: Pyral Freiberg
Project: Examination of flue-gas scrubbing system
Services: Planning work



General

At the aluminium recycling plant run by Pyral AG in Freiberg, the fluidized-bed furnace in operation there has a dry flue-gas cleaning system. This system, particularly the fabric filter is prone to malfunction. It is therefore being considered to completely replace the dry flue-gas cleaning system with a wet scrubber.

The scrubbers and the respective components are still in place from previous use.

T&N's first task was to make an inventory of the existing components. These were examined for suitability based on calculations and operating/design data for the fluidized-bed incinerator, and a concept for the flue-gas cleaning system was then developed.

Inventory and calculations

An inventory of the existing components was made on site. It was determined that the following configuration would be feasible for the flue-gas scrubber:

- Venturi quench (upstream)
- Jet scrubber
- Packed-bed scrubber

Calculations were then made to check whether the existing components are suitable to cope with the current flue-gas volumes and pollutant load.

The component rating proved to be essentially appropriate for the current volume of flue-gas, although extensive refurbishments would be necessary.

However, as regards the pollutant load of the flue-gases, particularly the high percentage of fine dust, a wet scrubbing process is to be regarded as problematic. The high percentage of fine dust having a grain size of $<2 \mu\text{m}$ cannot be separated using a wet scrubber alone. This fine dust would pass unhindered through the proposed scrubber configuration, resulting in an increased dust content in the clean gas.

Recommendation

It is not advised to convert the dry flue-gas cleaning system to a wet scrubbing system since the specified clean-gas dust content cannot be met.

Instead, it is recommended to enhance the existing dry system, optimizing it for current operating conditions of the plant.