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AIRFINE® - Integrated Gas Cleaning Technology for Sinter - and Pellet Plants

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Summary

AIRFINE® is a waste gas cleaning system which allows for the simultaneous removal of submicron particles, noxious waste components, including HCI, HF, dioxins and furans (PCDD/F), SO_x and heavy metals. The process was developed in order to fulfil the following objectives:

- Minimisation of noxious emissions at their source of origin
- Separation of finest particles and the simultaneous cleaning of gaseous components from the waste gas.
- Increase of flexibility in sinter plant operations through the realisation of an integrated by-product management concept.

The process can be divided into three main systems:

- Quenching system for coarse dust separation, waste gas cooling and saturation

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- Fine scrubber system for fine dust separation and simultaneous gas cleaning
- Water treatment facility for by-product separation

The heart of the AIRFINE® process is a fine scrubber system where specially developed and VAI patented dual flow nozzles eject water and compressed air as high pressurised mist jets into the cooled waste stream. This allows the removal of the finest dust particles and noxious gas components (PCDD/F, heavy metals HCI, HF, So_x) to a degree of efficiency that is unattainable employing conventional systems such as electrostatic precipitators. More than 90% of the total dust and aerosol content and even up to 98% of the organic components are efficiently removed from the off-gas.

Industrial water used as the scrubbing liquid is cleaned in a waste water treatment plant and recirculated in the process. By-products are recovered and separated. Ferrous components are recycled to the sinter strand, considerably reducing waste volumes and reducing disposal costs. At AIRFINE® plant of VOEST-ALPINE Stahl Linz more than 90% of the ferrous dusts are recovered as a valuable raw material, thereby reducing primary iron ore demands.

Unusable residues are immobilised for safe and low cost disposal. For this purpose LD slag may be added to the filter cake, which binds the heavy metals in an insoluble matrix. In this way the costs for waste disposal can be dramatically reduced.