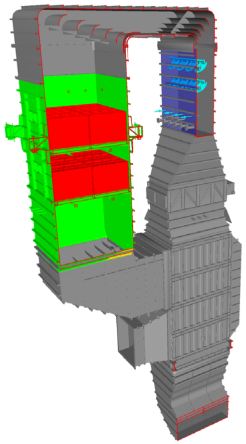
Technology Portrait:
Doosan Lentjes SCR Plants

The SCR process (selective catalytic reduction) is a very effective method for reducing nitrogen oxide emissions from waste incineration plants and has been used for many years. The process uses a catalyst and ammonia (in the form of a 25-30% NH_3 solution) as a reducing agent to convert the nitrogen oxides into nitrogen and water. The reaction takes place on the surface of a catalyst material. The catalytic material reduces the activation energy of the desired chemical reaction so that the NOx reduction can take place at significantly lower temperatures than in the SNCR process.



The low-dust process

It is preferred to arrange the SCR catalyst as a low-dust variant at the end of the flue gas cleaning chain (tail end). This arrangement has become established in waste incineration plants. Since in the upstream flue gas treatment acidic pollutant gases, fly ash and heavy metals are almost completely removed, the catalyst has a long service life in this arrangement.

The temperature window for low-dust SCR catalyst is usually in the range of 200 to 250°C. These temperatures can be achieved by preheating the flue gas using steam from the steam generator. If a low-temperature catalyst is used, operation at 160 to 180 °C is also possible.

Optimised plants

Doosan Lentjes SCR systems are optimised in terms of flow technology. Static mixers ensure good mixing of flue gas and additive. A baffle plate arrangement adapted by CFD simulation ensures a uniform flow onto the catalyst surface. This results in improved utilisation of the catalyst and low ammonia slip.

The reactor is designed so that all commercially available catalyst types can be installed. If required, an unequipped reserve level can be incorporated to enable customised catalyst management.

Features of the Doosan Lentjes SCR systems:

- Optimisation through Computational Fluid Dynamics (CFD) for maximum efficiency
- Very low NO_x emissions thanks to effective nitrogen oxide reduction
- Minimised use of additives due to almost stoichiometric consumption
- Low NH_3 slip due to efficient ammonia utilisation
- Destruction of dioxins and furans through oxidation

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