Hitachi Zosen
INOVA

XEROSORP+

Flue gas cleaning

XEROSORP+: Competitive, complete, compact

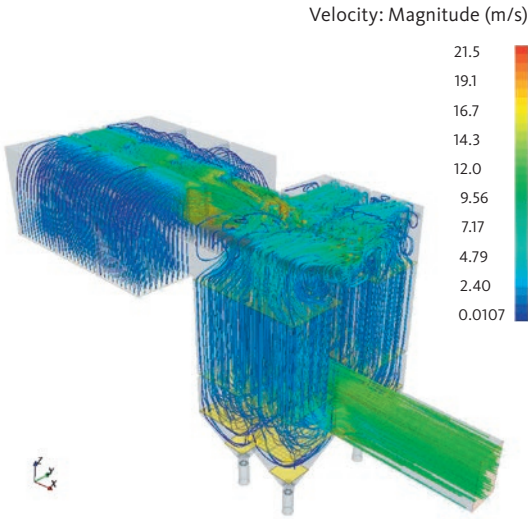
The Xerosorp+ process combines the advantages of the dry scrubbing process and low temperature SCR-DeNOx system.

Removal of acidic gaseous and organic contaminants together with heavy metal compounds is ensured by a dry scrubbing step in the first part of the unit. The multi chamber catalyst in the second part insures that NOx contaminants are removed effectively through the injection of ammonia between the fabric filter and the catalyst.

Dry scrubbing for efficiency and low residue levels

The dry scrubbing flue gas cleaning process is designed to remove acidic gaseous contaminants by absorption with sodium bicarbonate. Due to the very high reactivity of sodium bicarbonate a low stoichiometry is achieved. The process operates at temperatures around 200 °C thus enables maximum tail end energy recovery.
Heavy metal compounds and organic contaminants, such as dioxins and furans are separated by adsorption onto activated carbon or lignite coke in the same process step.
Flue gas is contacted with the absorbents in a reactor in order to react with pollutants like SO_2, SO_3, HCl and HF. Solids are entrained from the reacting zone and collected in the downstream fabric filter. A portion of the solids that are discharged from the filter are recirculated and re-injected into the reacting zone to optimize the utilization of the absorbent chemicals.

XEROSORP+: Bag filter, ammonia injection zone and SCR DeNOx



CFD Modelling of XEROSORP+: Bag filter, ammonia injection zone and SCR DeNOx

Operating procedures of the dry scrubbing process

Two control loops regulate the process to achieve low emissions and to minimize the consumption of absorbent:
The first loop continuously controls the flow of recirculated solids into the reacting zone by the measurement of pressure drop. The second control loop adjusts the flow rate of the reactant by measurement of the concentration of acidic gases before and after the flue gas cleaning process. The two control loops are set on automatic, but have the possibility of manual set point adjustment. Organic toxins like dioxins and furans in flue gas are either removed by adsorption on activated carbon or lignite coke.

SCR DeNOx at low temperature with periodical catalyst regeneration

Downstream the Fabric filter ammonia is injected into the flue gas in the short connecting duct. The SCR DeNOx system operates at temperatures below 200°C and consists of several chambers. Periodically the SCR catalyst is reactivated chamber by chamber in an offline mode while the whole FGC remains on full operation at nominal load.

Improved energy efficiency with tail end heat recovery

The flue gas temperature downstream the SCR DeNOx is lowered just above due point, thus recovering maximum energy in the flue gas cleaning process.

Compact unit for complete flue gas cleaning

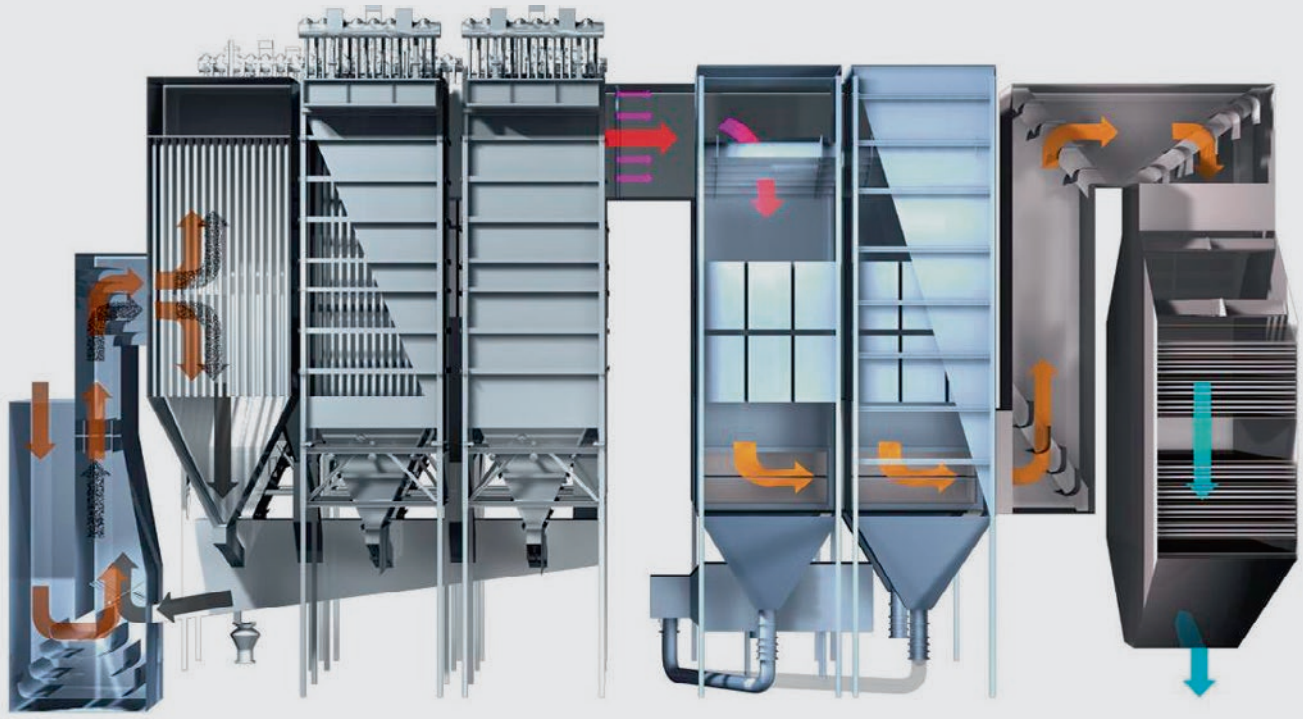
With XEROSORP+ the building volume is reduced significantly compared to traditional multistep flue gas cleaning plants.

Key advantages of the XEROSORP+ process:

- Very compact design
- Reaches lowest emissions
- Lowest Bicar consumption due to residue circulation
- Damping of peaks due to high residue buffer capacity in the recirculation system
- High energy efficiency due to:
  - Low pressure drop
  - Low regeneration rate of catalyst in offline mode
  - Tail end heat recovery

Xerosorp+ system functional scetch

1 Reactor with Bicar/activated carbon injection
2 Residue recirculation
3 Fabric Filter
4 Ammonia injection
5 Catalyst compartments
6 Tail end heat recovery



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