World-wide Reference Plants for more than 287 million m³/h or 74 000 MW(el)
SBEng Wet Absorber Technology

Absorbents
- limestone (lime), product gypsum
- Mg(OH)$_2$, NaOH and seawater

Variety of absorber design
- open spray tower
- wet limestone absorber
- perforated plate (tray), packing

Continuity
- technology development
- business

All kind of fuel
- bituminous coal
- lignite
- HFO, Orimulsion
- waste, used tires
Wet Limestone / Gypsum Process
Wet Limestone Absorber - SBENG Design

Mist Eliminator:
2 - 3 Layers

Raw Gas Nozzle
(Entrance)

Absorber-Sump
- Dissolution of Sorbent
  (Lime / Limestone)
- Formation of Gypsum Crystals

Clean Gas Nozzle
(Exit)

Absorption Zone:
3 - 6 Spray Banks

Agitators with Aeration
- for Oxidation

www.steinmueller-babcock.com
Wet Limestone Absorber - Advantages and Benefits

- Qualified for the whole range of SO$_2$ content
- Open spray tower
- Wet Lime Stone Absorber chemistry
- Removal of SO$_2$, HCl, HF and fly ash in one loop
- In-situ forced oxidation for lowest scaling potential
- High gas velocity possible
- Low gas side pressure loss
- Low Sulphite content
- High availability of “Ca” based absorbent
- Saleable gypsum quality (product)
Wet Limestone Absorber - Advantages and Benefits

- High availability and reliability
- Well experienced, excellent references
- Simple construction
- No additional external tanks needed
  \( \Rightarrow \) low investment cost
- Smooth walls, no internal fittings
- Lower operating expense for maintenance in case of rubber lining
- Identical design of all spray headers
Client: E.ON Benelux
Fuel: Hard coal (1.2 % sulfur content)
Capacity: 1 x 1,100 MWel
Flue gas volume: 3,200,000 Nm³/h wet
Process type: Wet-FGD, lime as reagent
Efficiency: SO₂-removal > 98.5 %
Final product: Gypsum (< 10 % Water)
Commissioning: 2015
Scope: Engineering, delivery, assembly, commissioning of flue gas desulfurisation plant with associated facilities
Special features: Emission limit value (annual average value): SO₂ < 40 mg/Nm³ @ 6 % 0₂, tr.
FGD : Plock/Poland

Client: PKN ORLEN S.A.
Fuel: Heavy crude oil (up to 2.8 % sulfur content)
Capacity: 3 x 230 MWel and 5 x 290 MWel
Flue gas volume: 2,640,000 Nm³/h STP wet
Process type: Wet-FGD, limestone as reagent
Efficiency: SO₂-removal > 97.9 %
Final product: Gypsum (< 10 % Water)
Commissioning: 2015

Scope: Engineering, delivery, erection, commissioning of 2 FGD-lines each consisting of spray tower absorbers, 2 booster fans and wet stack; equipment for truck and rail unloading, storage and dosage of limestone, storage of gypsum (Eurosilo), chemical and biological wastewater treatment

Special features: Complex flue gas system with 30 dampers, possibility for retrofitting of a heat recovery system
<table>
<thead>
<tr>
<th><strong>Client:</strong></th>
<th>GKM Aktiengesellschaft</th>
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<tbody>
<tr>
<td><strong>Fuel:</strong></td>
<td>Bituminous coal</td>
</tr>
<tr>
<td><strong>Capacity:</strong></td>
<td>911 MWel</td>
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<tr>
<td><strong>Flue gas volume:</strong></td>
<td>2.35 million Nm³/h</td>
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<tr>
<td><strong>Process type:</strong></td>
<td>Electrostatic precipitator and limestone scrubber</td>
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<tr>
<td><strong>Efficiency:</strong></td>
<td>Up to 99.9 % dust removal and 97.5 % desulphurisation</td>
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<tr>
<td><strong>Final product:</strong></td>
<td>Gypsum</td>
</tr>
<tr>
<td><strong>Commissioning:</strong></td>
<td>2015</td>
</tr>
</tbody>
</table>

**Scope:**
Electrostatic precipitator with ash handling, absorber with all ancillary facilities, heat recovery system and 2-stage wastewater treatment plant

**Special feature:**
Turnkey contract for complete flue gas cleaning
Description of Spray Bank
CFD Modelling - Optimised gas & slurry distribution

Computational Fluid Dynamics
CFD Modelling - Optimised gas & slurry distribution
Spraybank FGD Plant GKM #6, 300 MW
Sidearm of the spray bank; patented nozzle connection
FGD - Mist Eliminator and Absorber Outlet
Highly efficient mist eliminators
Side entry agitator with oxidation air supply
WE MAKE THE WORLD A CLEANER PLACE

Let´s work it out together.