Sorbacal® Dry Sorbent Injection -
a low capital solutions for HCl control
Sorbacal® DSI

- LNA experience with Dry Sorbent Injection
- What are the factors that impact DSI effectiveness?
- Review of proven DSI experience
Wide range of Flue gas Treatments processes

- Boiler
- Reactor
- Filter unit
- Chimney

**DRY**

**Spray Dry / Semi Wet**

**Wet process**

Calcium hydroxide

Milk of lime

Milk of Lime or limestone slurry

GYPSUM
DSI - Dosing unit & blower
DSI - Injection points
Sorbacal® DSI –
Factors that impact effectiveness

- **Flue gas properties**
  - Temperature
  - Moisture
  - Competing acid gases
  - CO₂ concentration

- **Reagent properties**
  - Particle surface area
  - Pore shape, size and volume
  - Particle size distribution

- **System properties**
  - Distribution of reagent injection
  - In-flight residence time
  - Particulate control device
Flue Gas Properties – Impact of Moisture and temperature

Acid Gas Hierarchy

- SO$_3$
- HF
- HCl
- SO$_2$

Temperature [°C]

Abatement HCl

Sorbacal® SP

HCl : 1200 mg/Nm$^3$ - CO$_2$ : 9 % - RS : 1.7
Reagent Properties – Impact of surface area & pore characteristics

Sorbacal® H
Standard
Hydrated lime

Sorbacal® A

Sorbacal® SP
Dechlorination performance
Sorbacal® SP vs. standard hydrated lime

HCl : 1200 mg/Nm³ - H : 10 % - SR : 1,7 - CO₂ : 9 %
System Properties – Sorbent Dispersion

1 Injection Point:
Penetration: 1m
$V_{\text{Inject}}$: 20 m/sec.
Length: 10 m

4 Injection points, 90°:
Penetration: 0.75m
$V_{\text{Inject}}$: 20 m/sec.
Length: 10 m
Recent pilot combustor results -
High Injection Temp results

- Inlet HCl
- Pre - BH HCl
- Post BH HCl

**High Temperature HCl Measurements**

Temp too high for effective in-flight capture

With BH - effective in-flight capture even at less than optimum temperature
Sorbacal® DSI – Summary

• HCl can be effectively controlled by the injection of calcium hydroxide reagents

• Effectiveness a function of;
  ✓ Flue gas properties
  ✓ Reagent properties
  ✓ System properties

• Field Trials can be typically be performed
• Further R&D to improve efficiency ongoing
• Contact LNA Flue Gas Solutions Group for more information