Sorbacal®

Waste-to-Energy

CASE STUDY NR 6 - FRANCE

Substituting sodium bicarbonate with Sorbacal® SP dry injection for SO_2 removal

THE CHALLENGE

A municipal waste treatment plant had three independent, fluidized-bed waste incinerator lines, each with a flow of three metric tons/hour. To conform to new regulations for acid gas emissions (European Directive 2000/76/EC) the lines had been fitted with bi-reactive dry injection FGT units and fabric filters.

The dry injection units could operate with either calcium- or sodium-based sorbents. Sodium bicarbonate had always been used.

The site operators wanted to reduce acid gas emission levels further: to significantly below regulatory limits, particularly for SO_2. The target values were 10 mg HCl/Nm^3 and 20 mg SO_2/Nm^3. These low values are desirable for plants equipped with post-filtration, low-temperature catalytic treatment of NO_x.

To address the emission reduction goal, Lhoist proposed a demonstration of the technical and economic effectiveness of its Sorbacal® SP calcium-based sorbent. The plant operators scheduled a three-week trial period on two lines, with the third continuing to use sodium bicarbonate as a reference. The very brief notice – only two months – and the short trial made the exercise a real challenge.

THE LHOIST SOLUTION

We provided a Sorbacal® Injecto-Matic Simplex DT unit fitted with a 50 m^3 silo. A dual injection head delivered sorbent to the two lines simultaneously.

Simple, robust and relatively inexpensive, the unit was installed and working in less than a day.

Using Sorbacal® SP both lines operated below the levels of 10 mg HCl/Nm^3 and 15 mg SO_2/Nm^3 – well within regulatory limits – and without requiring larger quantities of sorbent.

Sorbent performance during the three-week trial

	Sorbacal® SP	Sodium bicarbonate
Sorbent rate	11.3 kg/t of waste Without fine-tuning	12 - 13 kg/t of waste Nominal value
Gas rate at 11% O_2 [Nm^3/h]	20,500	19,800
O_2 [%]	9.8 - 11	9.7 - 10.5
H_2O [%]	12.8 - 14.5	15.5 - 17
HCl mg/Nm^3 at 11% O_2	4 - 9	8 - 10
SO_2 mg/Nm^3 at 11% O_2	1 - 8	8 - 12

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THE BENEFITS

The trial confirmed that the Lhoist package comprising a Sorbacal® Injecto-Matic and Sorbacal® SP met the operators' stringent emission targets. The unit's dual injection head was shown to efficiently deliver Sorbacal® to the two lines.

Despite the lack of time for fine-tuning during the trial, the results pointed to significant operating cost savings once conditions could be optimized. Additionally, the fast start-up demonstrated the package's convenience and suitability for the municipal incineration sector.

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