

Sodium Bicarbonate Dosing Systems

Lower-Carbon Powder Alkalinity Dosing for AMP8

A pioneering water company in the UK worked with Rospen to retrofit alkalinity and pH correction systems to meet AMP8, PR24 and Net Zero 2030 goals.

20-35%

OPEX Reduction

70%

Fewer HGV Movements

15-25 MWh

Energy Saved/Year

Client Challenge

The utility was using silos filled with 32% liquid sodium hydroxide, with energy-intensive heated tanks. This resulted in increased chemical and energy costs, HGV movements, spill risks, and negative impact on AMP and ODI performance targets.

The client required a reliable alkalinity dosing solution to minimise OPEX, reduce carbon footprint, enhance resilience, and support AMP8 Net Zero goals.

Powder Savings: Sodium Bicarbonate vs. Caustic Soda

1000 kg Pure NaHCO_3 at £882 vs. 32% Caustic Soda IBC (320 kg active NaOH) at £750

Sodium Bicarbonate
 NaHCO_3

1000 kg

Pure Solid

1000KG is equal to 1.5 IBCs
(IBC 1000 litres)

Cost: £882

Alkalinity Provided:
600kg as CaCO_3

21% Saving

Sodium
Bicarbonate

£1.48
per kg
alkalinity

Caustic
Soda

£1.88
per kg
alkalinity

**32% Caustic
Soda Liquid**

**320kg Active
NaOH**

Cost: £750

Alkalinity Provided:
400 kg as CaCO_3

NaHCO_3 : +0.60 kg alk as CaCO_3 per kg | NaOH : +1.25 kg alk as CaCO_3 per kg
Industry-standard equivalents used for fair alkalinity dosing comparison. Sodium bicarbonate offers better value, safer, easily handling.

Rospen's Solution

Fully engineered sodium bicarbonate dosing systems using dry powder storage, accurate loss-in-weight metering, and controlled slurry generation. Key elements include:

- Powder silo storage (5m³ and 45m³) with up to 112 days of storage
- Loss-in-weight screw feeders providing accurate dosing from 0.75 to 60 kg/h
- Turnkey GRP kiosks and mobile containerised systems for flexibility
- Full WIMES compliance with mechanical, electrical, control and instrumentation design

Results & Benefits

- ~21% chemical cost reduction per equivalent dosing volume
- 20-35% overall alkalinity-related OPEX reduction
- Scope 2 energy reduced from 15-25 MWh/year to 2-5 MWh/year
- 20-40% reduction in embedded transport carbon
- 30-70% fewer HGV/tanker movements
- Stable buffered pH control minimising overshoot risk
- Safer handling with reduced COSHH burden
- Estimated savings of £45k-£60k per annum per typical site

Why Partner With Rospen?

Over 50 years of specialist experience in dry chemical powder systems for the water industry. Services include plant and process design, mechanical and electrical engineering, control and instrumentation, installation, commissioning, operator training and after-sales support.

