Chemisorb+®: A Smarter Way to Deliver Powdered Activated Carbon (PAC) in Water Treatment

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Introduction

Chemisorb+® is an innovative, patented solution for delivering Powder Activated Carbon (PAC) in water treatment plants (WTPs). This whitepaper outlines the challenges posed by contaminants such as THMs and PFAS and explains how the Chemisorb+® PAC delivery system can quickly address these issues in a low-cost and dust-free way.

The Challenge: Emerging Contaminants in Water

Water utilities face increasing pressure to remove persistent and harmful contaminants, such as:

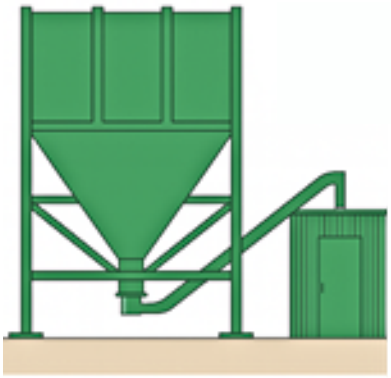
- Trihalomethanes (THMs): byproducts of disinfection linked to health risks.
- Per- and polyfluoroalkyl substances (PFAS): 'forever chemicals' resistant to conventional treatment.
- Other trace organics: pharmaceuticals, pesticides, and industrial compounds.

PAC excels at adsorbing these pollutants, but its fine particles and unstable slurries demand costly infrastructure for dosing and mixing. Rapid settling disrupts consistent feed rates, dispersion, and contact time. Dry PAC is notoriously dusty and exposure can lead to Health & Safety concerns and Hardware / Electronic Equipment failure.

Currently Available PAC Delivery Systems

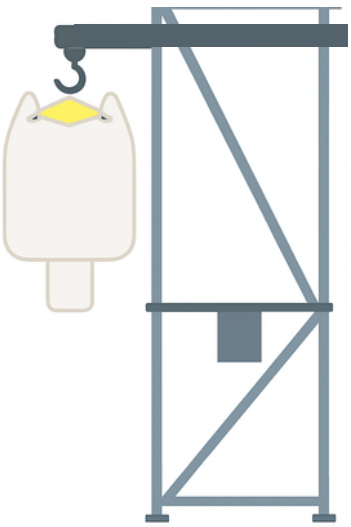
The available powder delivery systems can fit into three categories: large, medium, and small.

- **Large System:** Bulk hopper (50-100 m3, 10-30 T PAC) with screw-feeder to venturi. Suited for high demand (>20 kg/hour); permanent, clean, but costs €1-3M, with a lengthy equipment lead-time and planning process.



Large System

- **Medium System:** FIBC-based (1 m^3, 500 kg). Involves manual handling and dust; ~€100k, Long lead-time ~ 6 months).



Medium System

- **Small System:** Manual dosing of 12.5 kg bags into a 2-5 m^3 tanks for low demand (up to 5 kg/hour), creates dusty, hazardous environment.

Common issues with these systems include:

- High costs
- Lengthy lead-time
- On-site dry PAC handling can lead to health risks due to dust (without PPE)
- Equipment damage

Chemisorb+® as a solution

Chemisorb+® is a novel solution Chemifloc has developed, that eliminates traditional dosing hurdles by suspending PAC, for liquid-like delivery. You simply connect a hose to the suction side and the PAC suspension is drawn into the water pipe feeding the contact tank. No mess, no costly manual systems, and no complex planning required.

Key Features & Benefits:

- High PAC Concentration: Handles up to 30% w/w.
- Low Energy & Carbon Footprint: Efficient mixing and minimal energy input.
- Cost-Effective: Far lower installation and operational costs than dry PAC systems.
- Flexible Deployment: Works for temporary or permanent use with any PACs.
- Easy Integration: Compact, modular, and quick to set up.

Why Chemisorb+® Matters

Chemisorb+® revolutionises water treatment by monitoring key quality indicators in real-time while keeping PAC fully suspended for superior contaminant contact and lower THM formation. It delivers a scalable, future-proof solution for seasonal THM spikes or PFAS challenges, with rapid event response ensuring regulatory compliance (e.g., EU PFAS limits).

Perfect for trials, seasonal needs, or breakdowns:

- **Trials:** Mobile, automated, and easy to operate with any PAC. Ideal for quick proof-of-concept testing.
- **Seasonal dosing:** Rent short-term to handle peak periods without long-term commitment.
- **Breakdowns:** Deploy as an emergency backup for immediate, reliable treatment continuity.

Conclusion

With local support and flexible rental options, Chemisorb+® supports long-term use before capital investment is required.

> *Chemisorb+® allows us to bring high-performance PAC treatment online quickly, without the disruption, dust or upfront cost of a permanent installation. With local support and flexible rental options, we can run full-scale trials on our own network, optimise dosing through seasonal THM or pesticide events, and generate the hard evidence regulators need. That means if you do choose to invest in long-term infrastructure, it's based on proven results in our water, not assumptions."*
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> **Dr Ed Roycroft, Chief Science Officer, CSG**

We understand that every wastewater network is unique. Our scientists and engineers are available to discuss how Chemisorb+® can be applied to optimise performance in your facility. Get in touch to arrange a technical consultation **info@chemifloc.ie.**