Feeding and mixing powdered activated carbon (PAC) for water treatment applications

Subject: Gericke supplies a total turnkey solution for storing and dosing powdered activated carbon (PAC) into wastewater treatment systems. This system complies with Water Framework Directive (WFD) 2000/60/EC for the removal of poorly-dissolved or non-biodegradable organics in industrial, hospital or municipal wastewater.

Process equipment: The installation consists of a silo or a big bag storage unit combined with a feeding and mixing installation. A gravimetric feeding device also supplies PAC into the wastewater stream by means of a mixing cone. Depending on the quality of the wastewater, the amount of PAC added fluctuates between 10 and 30 mg/l.

The contact time of the PAC in the wastewater is normally between 15 minutes and 2 hours.

Area of application: Poorly-dissolved or non-biodegradable organics, dissolved organic matter, organic micro pollutants, medicinal residues, chlorinated solvents, detergents, flavourings, halogenated hydrocarbons, PAH and dissolved oils.

PAC is also used to determine the chemical oxygen demand and the total amount of organic carbon contained in the wastewater.

Product: Cabot, Norit PAC SEA Super D50: 10-50 mµ for different filtration rates.

Gericke technology: In partnership with Cabot, Gericke offers a total solution for feeding and mixing PAC in wastewater treatment systems. Special attention is given to the design and commissioning of these systems, as well as to monitoring the quality of the wastewater.
Gericke specialism: 100% dust-free operation with high accuracy. GOST certificates available.

ATEX: Gericke installations for PAC comply with the latest ATEX regulations.

Wastewater technologies: The major technologies using PAC are:
A) PAC in physical-chemical treatment.
B) PAC in bio systems.

PAC is dosed into the wastewater treatment system, the dosing level being flexible to suit requirements. Controlled feeding with Gericke feeding devices takes place without dust formation and allows the appropriate quantity of PAC to be added. The most suitable dosing system depends on the volume of wastewater, with available options including silos, big bags or sack discharge stations for manual input.

PAC in physical-chemical treatment
The PAC is dosed into the wastewater after the biological purification process. After a defined contact time, the PAC is separated out again into an outflow basin. The resulting sludge (consisting of flocculants and PAC) can then be processed further. To achieve “WFD effluent quality”, the required PAC dosing level is between 10 and 30 mg/l. The overall operating costs for the treated wastewater will be in the range of 0.1 to 0.25 Euro/m³.

PAC in bio-systems
The addition of PAC straight into the active sludge process is a common technique in many industrial wastewater treatment plants. The benefits of this include a significant increase in the efficiency of removing organic micropollutants and increased process stability. Most experience is based on conventional active sludge plants, while more recently the process has also been proven in membrane bioreactor plants. Once dosed into the wastewater, the PAC is incorporated into the bio-sludge.

As the PAC is dosed into a pre-existing treatment system, the overall costs for the bio-systems solution are lower, hence the costs are estimated in the order 0.1 Euro/m³ of water treated.