Gericke

Case Study No 13

FEEDING AND MIXING POWDERED ACTIVATED CARBON (PAC) FOR WATER TREATMENT APPLICATIONS

Subject

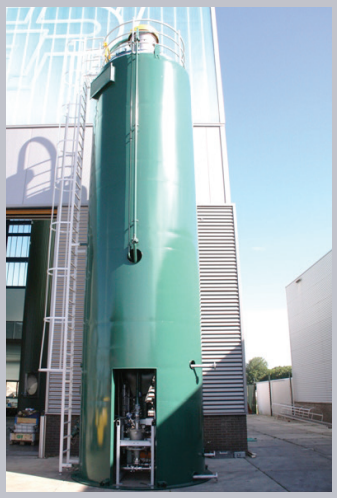
Gericke supplies a total turnkey solution for storing and dosing powdered activated carbon (PAC) into wastewater treatment systems. The system complies with the EU Water Framework Directive (WDF), for the removal of poorly-dissolved or non-biodegradable organics in industrial, hospital or municipal wastewater.

Process equipement

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

Powdered activated carbon (PAC or PACAS).

Gericke Technology

Gericke offers 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 feeding.

ATEX

Gericke installations for PAC comply with the latest ATEX regulations.

Wastewater Technologies

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 dosed ahead or into coagulation/flocculation tank. Following a certain contact time, the PAC is removed from the waste through the floc separation. Next, the sludge (flocculants and PAC) are further processed.
Typically, the contact time is in the range 0.25 to 2 h. The PAC dosing level is very much depending on the type and concentration of the target organics and the matrix. To achieve “WFD effluent quality”, the anticipated dosing level is in the 10 to 30 mg/l range; the overall costs will be in the range of 0.1 to 0.25 Euro/m³ water treatment.

PAC in bio-systems

Addition of PAC straight into the active sludge process is a commonly applied technology in many industrial wastewater treatment plants. Benefits are a.o. a highly increased process stability. Most experience is based on conventional active sludge plants, 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. Here the overall costs of the PAC will be lower, as the PAC is dosed into an already existing treatment system. Hence, the costs are estimated in the order 0.1 Euro/m³ water treated.

About Gericke

The Swiss Gericke Group has been designing and manufacturing equipment and systems for modern bulk material processes, as well as providing design and consultation services for more than 125 years. Gericke bulk materials processing technology can be found throughout the world in many sectors including the food, chemical, pharmaceutical, plastics and construction material industries.

Gericke’s fully owned group companies employ more than 300 experienced professionals and are located in Switzerland, Germany, Great Britain, The Netherlands, Belgium, France, USA, Brazil, Singapore, Indonesia, Malaysia, Thailand and China.