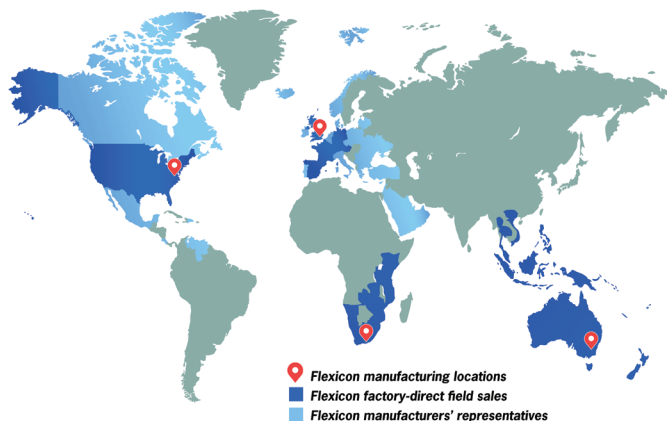




Bulk bag and lifting frame of the BFF-C-X Bulk Out™ split-frame bulk bag discharger shown separated from the stationary discharger frame inside the container.

## Mobile Discharging of PAC from Bulk Bags Helps Solve Pesticide Overload Fast at WTW

CC-0591



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# Mobile Discharging of PAC from Bulk Bags Helps Solve Pesticide Overload Fast at WTW

ALFRETON, DERBYSHIRE, ENGLAND — When a water treatment works in northern England faced a spike in pesticide concentration exceeding the allowable concentration limit for the incoming water, the site was forced to shut down. The company then had to divert water from a regional water treatment works in order to provide clean drinking water to its customers until the problem could be solved.

The solution arrived in the form of a mobile, lorry-mounted carbon dosing system, housed in a 6 m long steel shipping container that was delivered and activated within one day, without costly and time-consuming site preparation, construction or complex components.

The mobile powder handling and carbon dosing system includes a bulk bag discharger and two flexible screw conveyors from Flexicon (Europe) Ltd. and an ejector system from another manufacturer for mixing and injecting a slurry of PAC (powdered activated carbon) into the municipal water stream.

The mobile unit requires only connections to an electric power supply, the municipal water stream, and an external water supply. Environmental impact and site preparation are minimised, as well as the need for maintenance and planning permission. The system is safe to operate, and simple to control.

The water treatment works was restored to compliance as the dosed carbon successfully removed pesticide traces from the main water stream. Dosing is accurate and steady without over-dosing or wastage.

From the BFF-C-X Bulk-Out™ split-frame bulk bag discharger, PAC is automatically transferred from a half tonne bulk bag through a flexible screw conveyor to a surge hopper from which a second flexible screw conveyor meters the powder into the ejector.

## Split-frame discharger fits inside container

A forklift loads the 1.8 m (5.9 ft) high bag-loading frame and 500 kg (1100 lb) bulk bag onto the 0.9 m (3 ft) high stationary discharger frame inside the shipping container. Once the bag spout is untied, the powder flows into a 5 m (16.5 ft) long, 80 mm (3 in.) diameter flexible screw conveyor leading to the 930 l (33 ft<sup>3</sup>) capacity surge hopper. A second 3.5 m (12 ft) long, 67 mm (2.5 in.) diameter flexible screw conveyor moves the carbon powder from the hopper outlet to the intake of the ejector that accurately doses the PAC into the municipal water stream.

The conveyors are curved to fit the tight space within the shipping container.



Bulk bag and lifting frame of the BFF-C-X Bulk Out™ split-frame bulk bag discharger shown forklifted onto the stationary discharger frame inside the container.



The 5 m long flexible screw conveyor (top left) moves the carbon powder from the bulk bag discharger to the green surge hopper.



The curved 3.5 m long flexible screw conveyor moves powder from the green surge hopper to the intake of the ejector (right).

From the control panel, the operator sets the speeds of the conveyor drives to automatically dose the proper amount of PAC according to the site water flow. Low and high level sensors in the surge hopper signal the controller to start or stop flow through the first flexible screw conveyor when the hopper contents reach low or high level.

### **PAC poses handling problems**

Powdered activated carbon adsorbs the pesticide on its surface, and the carbon and adsorbed material are subsequently removed as sludge in the flocculation process. However, the extremely fine powder, with an average particle size of only 20 microns and a bulk density of 230 kg/m<sup>3</sup>, is prone to dusting.

Both the bulk bag discharger and flexible screw conveyors prevent dusting. The bag outlet spout is connected to the feeder by a Spout-Lock™ clamp ring, which creates a secure, dust-tight connection between the clean side of the bag spout and clean side of the bag spout interface.

Each flexible screw conveyor consists of a stainless steel screw rotating inside a durable polymer tube that contains the fine powder as it is conveyed. The conveyor discharge is likewise dust-free, as powder exits through a transition adapter located forward of the drive at the discharge end, thereby preventing powder from contacting bearings or seals.



*The ejector mixes and doses the slurry of powdered activated carbon into the municipal water stream.*



*Extra fine powdered activated carbon is prone to dusting, but is contained by the flexible screw conveyors and dust-tight connection at the discharger's bag spout interface.*

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