



Polyacrylamides

[POLYMERS]

Services to the Wastewater Industry

Polyacrylamide flocculants are used for many solid-liquid separation treatment processes and it is their ionic charge that allows them to adsorb onto small particles of matter floating in a solution. Flocculants are basically long chains of charged molecules, which are suspended in water.

Positively charged molecules are known as cationic whilst negatively charged molecules are known as anionic. Those with a balanced net charge are known as non-ionic.

Cationic products are generally used with organic wastes and anionic products with inorganic (often mineral) wastes but remember that not all the solids being collected are waste. In the paper making process it is the water that is considered the waste product.

Non-ionic products often perform well in very acidic conditions but none of these statements are hard and fast rules. The choice of product can only be adequately achieved by jar tests and laboratory trials.

Flocculants are dosed in very small volumes (parts per million) and when correctly applied will adsorb almost entirely onto the particulate material that the process is designed to capture. Once adsorbed, these polyacrylamide chains are inextricably fixed onto the particles they have attached to.



Flocculated solids will be separated from the liquid phase by a variety of process, which could include gravitational settlement (Such as the Dexter Watson Sludge Thickening /Dewatering Container), mechanical settlement or filtration. The liquid phase may be recycled as process liquid, via the Dexter Watson Final Filtration Unit or discharged away from the treatment area, generally through a sewer or harvested for recycling or disposal via alternative routes.

If the flocculant is being applied correctly then the volumes of residual polyacrylamide in the liquid phase will be infinitesimally small and will present no risk to marine life in a watercourse. [Environment Agency R&D Technical Report P21, 1996: Page 16, 3.1.7.]

“On balance, under normal operating conditions and using optimum polyelectrolyte dose, no residual cationic polymer is likely to be present in effluents arising from water or waste water treatment plants. By comparison anionic polyacrylamides may show more potential to remain unabsorbed and thereby the risks of entering watercourses are higher.”

Caring for the environment, by design...



Factors affecting Flocculation

- Correct Flocculant
- Charge
- Molecular weight
- Solution Strength
- Sludge suspended solids
- pH
- Coagulation
- Structure & Saline content



• Flocculants are very viscous, the applied solution strength will greatly affect the amount of mixing required to achieve optimum flocculation.

• The more dilute the polymer the more hydraulic loading it creates in the system.

Some of the Polymers we commonly supply:

Our most common selling polymers are,

- **DW80SC** - A non-hazardous cationic “superfloc”. A unique high molecular weight, highly charged flocculant ideal for thickening and water clarification. DW80SC being non-hazardous makes for improved operator handling and its high molecular weight makes it economical to use as it requires significantly lower dosing rates than other competitive products. It dissolves rapidly in water from liquid form reducing preparation time and handling. It boasts a tenacious floc for highly efficient results.
- **DW6085HS** - A specialist polymer aimed at biological and high ash content sludges, it’s above average molecular weight and specialist formulation provides improved results in flocculation both in speed and in economy. It is particularly well suited to the waste water treatment industry where utilising gravity settlement and forms a strong cake solid.
- **DW30AM** - A anionic “superfloc” specifically developed to be used in effluent process, however significant benefits have been seen in flocculation of alternative sludges. The DW30AM is a highly efficient formula with improved rates of floc settlement, sludge compaction and water quality. Its molecular structure makes it ideal to control Phosphorus amongst other sludge contaminants. Thanks to its high rate of settlement, high removal and viscosity modification tendencies DW30AM is an extremely cost effective option for dewatering systems.

Dexter Watson also have the ability to sludge sample and can provide additional polymers and blends of multiple polymers for more specialist and tenacious sludges with many more polymers available:

- **AN53EM**
- **DW6083MS**
- **DW6085HS**
- **SC60DW**
- **SC45DW**
- **CAT84EM**
- **HB64EM**
- **CAT64EM**

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