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Application Guide: FlocBlocs

Product description

DamClear FlocBlocs provide a simple and convenient method for applying flocculant polymers to water requiring clarification.

FlocBlocs consist of fine granules of powder grade flocculant dispersed in a non-toxic and readily water soluble binding polymer.

As water flows over the Bloc, flocculant is released which combines with the sediment, causing the sediment particles to agglomerate so they settle rapidly, leaving behind clear treated water.

Which product?

Two grades of FlocBlocs are available, FB-4308 & FB-4058. Both are well suited to sediments and clays.

Normally, both grades will work equally well, but for some applications one of the two grades will work better than the other.

The surface chemistry of the clays/solids dispersed in the water determines which grade is best suited in any particular application. Of secondary importance is the pH and conductivity of the waters to be treated.

A good way to decide which grade is best for your application is to jar test each grade separately on samples of the water to treat, and then comparing the results.

For new applications, we recommend jar testing or trialing both products on the water to be treated first before full-scale deployment.

The following points as a rule of thumb may be useful, although these are not hard and fast rules:

- **DamClear FlocBloc FB-4308**
  - → water pH is relatively neutral (pH 6–9)
  - → salinity is low (conductivity <5,000 µS/cm)
- **DamClear FlocBloc FB-4058**
  - → water pH is tending acidic (pH <6)
  - → salinity is becoming significant i.e. conductivity >5,000 µS/cm
  - → where chemical pretreatments such as alum or PAC are applied prior to the FlocBlocs

Application instructions

1. **Treatment of dam water inflow**

   Position FlocBlocs in a wire mesh cage in running water upstream from the dam at an area of turbulence that ensures contact with most of the water flow. Create an area of turbulence if none exists to maximise effectiveness.

   To ensure a suitable dose rate for large water flows, 2 or more FlocBlocs can be used at once.

   The FlocBlocs should be positioned so that they are immersed in the flowing water during storm events, but not in contact with the water when it is not flowing. This can be achieved by suspending a cage containing the FlocBlocs above the dry weather water level and positioning it low enough to be in contact with water during a storm event.

   Two application points in the pipework or drainage area leading to the dam can often be beneficial:

2. **Treatment of a full dam**

   Water in a full or partially full dam may be clarified by recirculating water from one end of the dam to the other and placing FlocBlocs at the re-entry point. A pump suitably sized to give a rapid turnover of the total dam volume should be used.

   FlocBlocs are best applied by discharging the return water into a tank of about 1,000 litres. Use a proportionately larger tank if the water flow rate is >100 kL/h. The tank should be positioned near the dam at the re-entry point so that treated water overflows from the tank back into the dam.

   FlocBlocs should be secured in a cage positioned in the tank. Tangential flow in the tank will aid mixing. The dam water should be recirculated long enough to turn the entire dam volume over once. Solids flocculation should be visible in the water overflowing the tank and they should settle in the dam. Water clarity will slowly improve across the entire dam as pumping continues.

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Answers to common questions…

1. FlocBlocs should be removed from their plastic containers before use.
2. FlocBlocs do not affect the pH or salinity of the water being treated.
3. Simply placing a FlocBloc in a dam or body of water will not clarify the water. FlocBlocs require running water to 'scour' the chemical from the FlocBloc.
4. FlocBlocs should not be left in still water for long periods of time as they will swell to form a gel around the outside of the FlocBloc. When this occurs the scouring mechanism is disrupted, and the FlocBlocs will become much less effective.
5. Too much turbulence after flocculation may degrade the ability of the flocs to increase to a suitable size. This is overcome by providing an area after the initial mixing zone where the turbulence is quite low or almost negligible (like in the dam itself). This low turbulence area allows the flocs to join together and increase in size without breaking apart again because of the high turbulence. This in turn should help maximise the settling rate of the flocs.
6. The dose rate can be increased by providing more FlocBloc surface area. This can be achieved by:
   - > using more than one FlocBloc at just a single location,
   - > using several FlocBlocs in series at different locations along the water path,
   - > breaking a single FlocBloc into smaller pieces and applying all pieces. Breaking into smaller pieces will increase the consumption rate, thus a single FlocBloc in pieces will be exhausted sooner than a complete FlocBloc.
7. Jar tests can be used to establish the best FlocBloc grade as well as the best dose rate for a particular application. Jar tests compare the floc size, the rate of floc settlement, and final water clarity when equal quantities of FlocBloc are added to equal volumes of water.
8. Typical application (dose) rates are 0.5–10 mg/L. Another way of saying this is 0.5–10 kg per 1,000,000 litres of water.

   Assuming a FlocBloc dose rate of 6 mg/L, then a single 3 kilogram FlocBloc should treat 500,000 litres of water.
9. Do not overdose. Avoid overdosing by using only the appropriate number of FlocBlocs suited to the volume of water for treatment.
10. The speed of flocculation is affected by water temperature and the water solids content:
    - > colder water requires a longer mixing period than warmer water, mainly because (a) the viscosity of the water increases as the temperature drops, (b) the polymer chain takes a little longer to unravel to its full length as the temperature drops,
    - > low solids water requires a longer mixing period than high solids water, mainly due to low solids water having a lower particle 'collision' rate. Particles must collide with each other for the flocs to form, and with lower particle numbers the collision rate is decreased for the same mix time, hence the need to increase the mix time to get the number of collisions up to a suitable count. This is really only applicable though for very low turbidity (i.e. quite clear) feed waters.
11. The active ingredient in FlocBlocs has been used for over 50 years in applications such as dam water clarification, drinking water purification, pollution minimisation, industrial wastewater treatment, mining, paper making and sewage treatment. The active ingredient is safe and is widely used to minimise pollution from many industrial and mining applications. It has a very low order of aquatic toxicity, and when used according to this Application Guide, is safe for most aquatic environments encountered in normal use.

Waters that are difficult to treat

On those occasions where the clay suspension is ultra-stable, the water can first be treated with one of the DamClear Clarity Aid products, and then passing this treated water over FlocBlocs.

This treatment regime of applying a coagulant first (the Clarity Aid) followed by the addition of a flocculant (the FlocBloc) will give the highest quality water possible from a chemical treatment process, and depending on the choice of Clarity Aid, it will work on almost any water source.

We have products available for every type of water clarification situation.
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