TANFLOC POWDER DISSOLUTION PROCEDURE

1. Product characteristics

Parameter	Value	Notes
Minimum active tannin concentration	93.5%	Total solids of the coagulant from Acacia mearnsii extract at the time of packing. Despite the product is a hygroscopic powder, the maximum water content at the time of packing is 6.5%;
Bulk density	0.45 – 0.65	Value obtained weighting the sample in glass cylinder
Humidity	4.5 – 6.5 %	
Appearance	Brown powder	

2. Water Quality Required

Low chlorine water (<0.5lg/L), free of suspended solids, with total hardness lower than 100 ppm $CaCO_3$ should be preferred. In most cases tap water is appropriate.

3. Material Compatibility

Preferably the equipment is built in stainless steel, but some plastics, like PP, PVC, PE and fiberglass are also acceptable.

High shear conditions are not necessary. Usually an ordinary impeller similar to the ones used in jar tests is adequate. Caution should be taken to avoid too energetic conditions that are likely to promote foaming.

4. Quantity of TANFLOC powder required for dilution at a given % into solution

The humidity of the tannin powder supplied is variable, requiring that product end-user should measure the level of humidity on a small sample and calculate the true activity of the powder before usage. This will allow a more accurate dosage of the powder when preparing the tannin solution.

Example: Quantity of tannin powder and water necessary to produce a TANFLOC at a 20% Total Solids Solution.

20% TOTAL SOLIDS SOLUTION PROCEDURE

Determine the moisture of the TANFLOC to be dissolved;

Calculate the necessary amount of water and TANFLOC to be added in the dissolution, according to the example;

Add the product over the water at the room temperature, stirring until complete homogenization.

Example of dissolution to obtain 1000 kg with 20% of total solids:

a) Amount of product to be added:

E = Ex x ST2 ST1

Whereas:

E = Amount of TANFLOC, in the original form, to be utilised in the dissolution;

Ex = Amount of the TANFLOC to be obtained after the dissolution (Kg). In this example is 1000 Kg;

ST2 = Total solids in the final dissolution. In this example is 20%;

ST1 = Total solids in the product to be dissolved:

ST1 = 100 – U;

Where U = Moisture of the product to be dissolved;

For this example, we have U=5%;

Thus, ST1 = 100-5 = 95%;

ST1 = 95%.

E= (1000x20)/95 = 210.5kg

b) Amount of water to be added

Q = Ex - E

Whereas:

E = Amount of TANFLOC, in the original form, to be utilised in the dissolution;

Ex = Amount of the TANFLOC solution being prepared (kg). In this example is 1000 Kg;

Then,

Q = 1000 kg – 210.5 Kg

Q = 789.5 kg of water to be added

Summarising:

Starting from a TANFLOC powder containing 5% moisture, to obtain a solution of 1,000 Kg of TANFLOC at 20% of total solids, will be necessary the following quantities:

210.5 kg of TANFLOC in the powder form; 789.5 kg of water.

Additional Information

For the preparation of solutions for lab trials and jar tests, we recommend a simple dilution w / v (weight per volume):

- To a 10% solution, dissolve 10 g of powder in 90 mL water;
- We recommend to use warm water (25°C - 40°C) to accelerate the dissolving process;
- Recommended for both cases the use of soft water with less than 100 ppm of CaCO3 and free from residual chlorine.

 5. Dissolution Procedure

The process is relatively simple and be accomplished following the procedure described below.

In order to obtain a homogeneous solution, the stirring process must take at least 30 minutes, Depending on the stirring intensity, temperature, batch size and TANFLOC powder type the dissolution process can demand more time.

1 - Half fill the dissolution reactor with dechlorinated water, keeping the temperature from 25°C to 40°C with the agitation at 450 rpm;

2 - Open the bag of TANFLOC;

3 - Slowly add TANFLOC powder whilst stirring at 450 rpm to ensure complete dissolution;

4 - Complete the total volume or mass of the solution with the remaining water;

5 - When transferring the finished solution from the reactor to containers or tank trucks, filtration with a 1 mm or 2 mm mesh is recommended.

6 - Be aware of foam development if the turbulence of liquid transfer is too high.

A summary of operations is on Table 2.

Operation	Time (min)	Agitation (rpm)
Adding Water	5	450
Adding the TANFLOC Powder	10	450
Mixing	15	450
Adding Water	5	450
Mixing	30	600

Important remarks:

- The water temperature should not exceed 50°C, otherwise precipitation, clumping or gelation may occur.
- The bag must be opened immediately before the dissolution process;
- Clod could be made when the storage period becomes longer, but they can be broken
- by hand.
- An exhaustion system may be needed to collect the finer powder and return it to the mixing vessel.
- Keep the TANFLOC solution under stirring in the storage tank to prevent foaming during discharge. If the liquid transfer is turbulent intense foaming may occur. Use pneumatics and magnetic pumps for discharge and transfer operations and avoid the use of air.
- All the equipment involved in the dissolution process can be cleaned with water.
- No precipitate is formed when the dissolution process is successfully performed.

Stability test

This test aims to estimate the shelf life of TANFLOC.

According to our experience, the test conditions are quite severe and hold a good correlation with the natural stability.

Preferably the equipment is built in stainless steel, but some plastics, like PP, PVC, PE and fiberglass are also acceptable.

It's an empirical test backed by TANAC's long-term experience in testing tannin extracts and tannin derivatives in Brazil. The sample is placed in an incubator at 55–60°C and kept at this temperature for a period of 20 to 30 days. After this period is elapsed, the sample condition and its viscosity are recorded. Provided that sample viscosity is still below 60 cP, we assume that the product is stable at room temperature for at least six months.