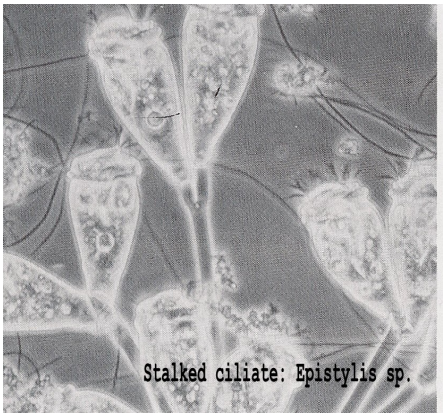
BioFuture Ltd.

Industrial

BFL 5300PP

The effluent from the pulp and paper industry contains large quantities of plant organic materials such as cellulose, hemicellulose, lignin, starch, etc. In addition there are many organic chemicals arising from the paper making process, particularly from bleaching and deinking. The pulp and paper industry is characterised by discharging very large volumes of warm water with variable organic strength and pH. This causes a number of problems with the treatment of such effluents. The variability in composition and the wide range of compounds in the effluent require a biomass with a broad range of activities for effective treatment.. Due to the large volumes it is necessary to have a biomass with good settling characteristics so that a clarified final effluent can be produced.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While the degradation of starches is relatively easy, the degradation of cellulose, hemicellulose, lignin and organic chemicals are more difficult. This can result in poor effluent quality.

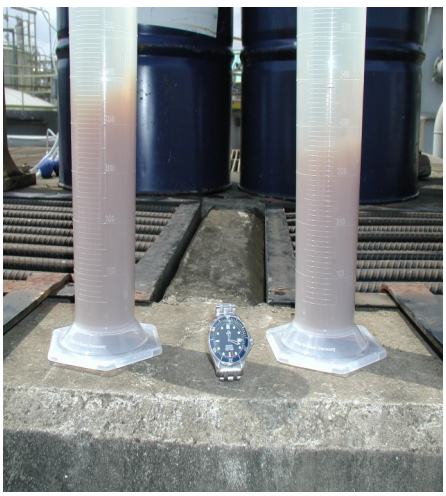
Situations in which the use of BFL 5300PP are beneficial include:-

Plant start up	**Re-seeding**
Poor settlement	**Poor final effluent quality**
Overloaded plants	**Shock recovery**
Bulking sludge	**Sludge reduction**

BioFuture harnesses the power of environmental biotechnology to solve the problems by degrading the cellulose, hemicellulose, lignin and organic chemicals in a highly efficient way. BFL 5300PP uses only harmless, natural micro-organisms that eliminate the problem by degrading the organic matter to CO_2 and H_2O in a highly effective and environmentally acceptable way.

What is BFL 5300PP?

BFL 5300PP consists of a carefully selected blend of natural micro-organisms that have the ability to efficiently degrade cellulose, hemicellulose, starch and other organic materials in the effluents from pulp and paper processing. The wide range of strains have been specially chosen for their ability to produce the broad range of enzymes required to completely degrade the organic matter. These strains grow at a fast rate so that they can quickly establish dominance in the biomass, which is the heart of the wastewater treatment system. The product contains strains, which have the ability to produce good floc structure which will settle well and produce a clear final effluent. The strains in the product work in harmony with the existing biomass and



increase its overall efficiency so that plant performance is restored as quickly as possible. The product blend contains facultative strains, which can work effectively in lagoon systems where oxygen is limited.

The type of systems in which BFL 5300PP can be used include:-

Activated sludge	**Oxidation ditches**
Biotowers	**MBBR/IFAS**
Aerated lagoons	**Membrane BioReactors**
Sequencing batch reactors	

The microbial strains are produced as single pure cultures, harvested, stabilised on a cereal base and blended together to produce the final product. Extensive checks are conducted throughout the process to ensure purity and quality of the product.

Directions for use

The product as supplied is on a cereal base so it is important that the bacteria are rehydrated before use. This is achieved by adding the required quantity of product to lukewarm (~30^{o}C) water in a suitable container. Apply 1 part product to 10 parts water, stir well and allow to stand for 1 hour before application. Apply the rehydrated product immediately prior to the aerated section of the treatment plant e.g. into a drain, pump sump or return sludge line.

Since each application is different and has different characteristics it is important to assess the site before deciding on a dosing programme. The BioFuture Technical Department provides assistance in assessing the site and devising a treatment programme.

Product safety

The micro-organisms in BFL 5300PP have all been isolated from natural environments. They have not been genetically modified in any way. These microbial strains have been classified as being harmless to humans, animals and plants in accordance with EU and WHO guidelines. The product is subjected to independent testing to ensure that it is free of *Salmonella* and other contaminants.

For further information on dosing programmes and product application please contact: -

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