

## Pulp & paper mill bio-augmentation

Special microbial enzyme for pulp & paper  
wastewater,



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## Introduction

The Pulp & paper industry is characterized by high operational water usage. The wastewater from the pulp and paper industry contains high concentrations of biochemical oxygen demand (BOD) and chemical oxygen demand (COD) and shows high toxicity and strong black-brown color.

In particular, organic chlorinated compounds such as dioxins and furans may be formed by the chlorination of lignin in wood chips. Thus the pulp and paper industry is recently trending toward total chlorine-free (TCF) bleaching processes.

Tangsons biological technologies for pulp and paper wastewater treatment are based on the contact between wastewater and bacteria, which feed on organic materials in the wastewater, thus they reduce BOD concentration in it.

## What is Pulp & Paper bio-augmentation?

High Potency, Bacterial-laden, Powdered formulation, Selected from natural, contains a specially formulated blend of microorganisms, micro and macronutrients, fungi, and surface tension, suppressants or penetrants, developed for use in bio augmentation.

Pulp & Paper bio augmentation is specially use for pulp & paper industrial waste water to reduce/ removal of specific contaminates like lignin, cellulose, hemicellulose, it can enhance system anti-shock ability and optimize reliability and sustainability.



## Application & Uses

- Special for paper making and pulp mill industrial wastewater, which content of cellulose
- Pulp Mill
- Paper Mill
- Kraft mill
- Special Papers

## Benefit

- ✓ Specially suitable for pulp & paper acidic wastewater, pH range 4.0~70
- ✓ Reduces hydrogen sulfide and sludge build-up
- ✓ Increased BOD and TSS removal efficiency, enhances BOD/ COD removal
- ✓ Reduce difficult-to-digest organic, including cellulose, hydrocarbon, surfactant, dyes chemical,
- ✓ Reduction in filamentous bulking
- ✓ Change biomass dynamics, Greatly reduces labor time
- ✓ Cost Effective / Easy to use, no special equipment needed
- ✓ Eliminates malodors at their source
- ✓ Degrades a wide variety of complex organics
- ✓ Reduction in polymer and dewatering costs, Reduces solid handling costs,

## Dosage:

Initially dosage 10~ 30 gram per cubic wastewater to start-up biomass culture,

Routine dosage 1~5 gram to maintain performance.

## CASE STUDY



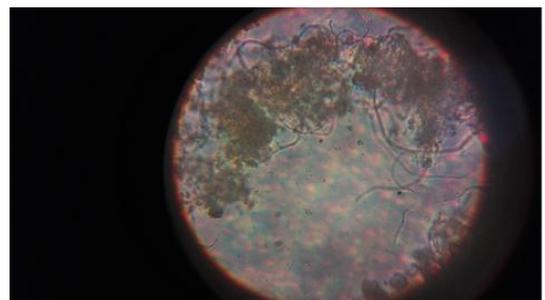
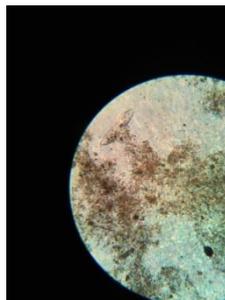
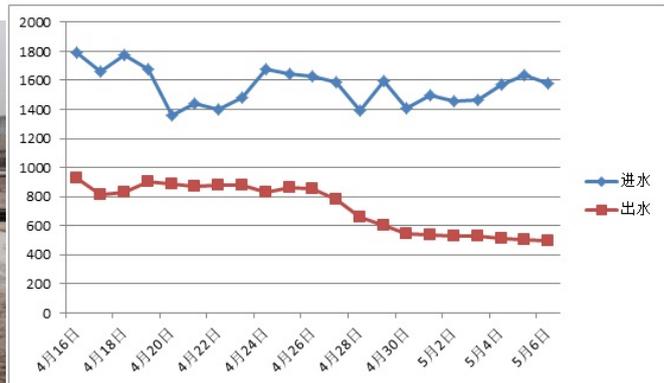
Chengming Group is leading Paper Company in China, involved in pulp, paper, heat and electricity.

### Wastewater features:

- Wastewater treatment capacity: 30,000 m<sup>3</sup> /d;
- Contains a lot of difficult-to-degradation organic such as lignin, fiber, semi-fiber, surfactant, etc
- A lot of sludge floating due to inactivated,
- Organic degradation performance is under expectation, floating sludge
- Contains color bubble;
- Difficult for wastewater treatment;

### Solution:

- Adopted bacterial products: Pulp and paper bio augmentation, COD remover (Pulp & Paper), Sludge removal, Biological detoxification ;
- From right table shows that, COD is 900 mg/L before using, after using 5 days, COD reduced, and until to 14 days, COD reach to 497 mg/L;



Gold hongye paper group, invested by Asia pulp & paper co., ltd, was established in March 1996, yearly produces 800,000 tons of base paper for household and 500, 000 tons of finished products annually.

### Wastewater features:

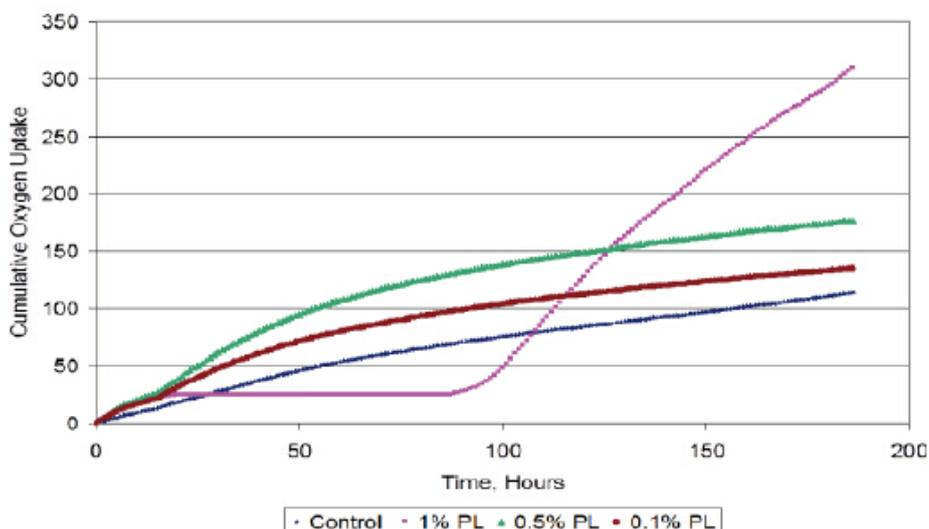
- Wastewater treatment capacity: 8,000 m<sup>3</sup> /d;
- SBR process, average COD is 238 mg/L
- Caused by influent COD concentration is variation constantly, effluent fluctuation is very high, and cannot meet discharge standard stabilizable.
- High operation cost

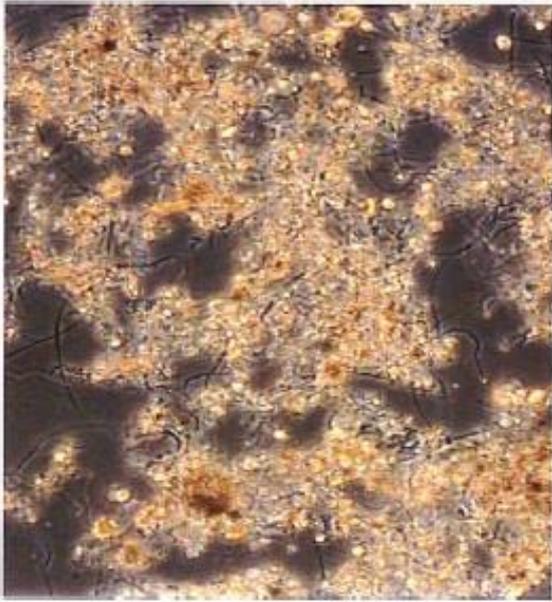
### Solution:

- Dosing pulp paper bio augmentation + COD remover (Pulp & Paper), after 15 days later, COD reduced from 238 ppm to 120 ppm,
- During bio augmentation period, aeration pond was suffered two times big load shock, but effluent parameter did not rise, improved system anti shock ability
- TDS is reduced, and activated sludge is greatly improved.

### Economic Benefit:

- Comparing with chemical treatment, Bio augmentation cost is USD 0.15 per cum wastewater, while chemical cost is USD 0.23 per cum wastewater,
- Saving cost USD 600 daily for paper factory.





Activated sludge before



activated sludge after