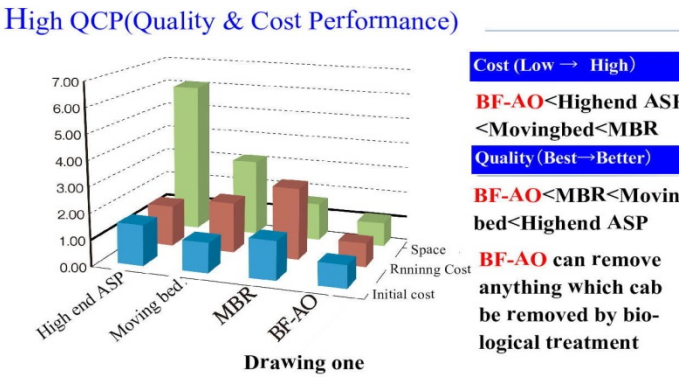
[Swim-bed Biofringe] enlarges the possibility of wastewater treatment technology by aiming actively restore the nature

Koyama Toichiro the President of NET CO. Ltd

NET Co. Ltd has been grown in a different way from ordinary engineering companies Because the company's products have many innovative effects by to integrate the dispensation from the Nature and it is based on the highly organized textile industry's technologies.NET 's organization is small and is outsourcing design and manufacturing function, so that can move quickly. NET has developed new area of biological treatment by using Swim-bed Biofringe (BF) and has reached the level of the Best One in the World. NET is now making stable supply of high quality and low cost contact oxidation material (BF) which gives innovative effects on treatment system. And the company also offers technical support how to use BF so that the customers of BF are able to achieve the highest QCP (Quality and Cost Performance).

1. Introduction

The textile industry was the key industries after second war in Japan. Output from the industry accounted for about 65% of GNP at that time. Then car manufactures such as Toyota, Suzuki, and Honda came up from textile industry and became the top industry of the world by using market research to find customer's needs and make their products to fit to it. For Japanese car manufacture, it was turning point when they cleared the Clean Air Act of 1970 (the Muskie Act). Nishijin brocade, representing Japanese Kimono, has been made by assembles of many small textile companies in Kyoto. The other hand, the UNIQLO's success comes from their outstanding production and distribution system, so that they can sell jeans less than ¥1,000 with good quality. Other companies which mimicked the UNIQLO system, failed because their product was also low cost but no good in quality. It is clear that the idea the lower the price, the more the sell is wrong. The drawing below shows comparison of BF and other systems. You can see the BF's QCP is the best among other systems.



Drawing one

2. Results

BF is manufactured by high technologies selected from textile industry, so that the efficiency is highest among similar products. NET developed and started selling BF twenty-five years ago. From then, BF has been sold more than 430 customers now in cooperation with local small/medium

engineering company. In contrast, MBR (Membrane Bio Reactor) system has been sold 3,500 systems, but government, universities, and big engineering companies have injected huge money to develop this system, so that cost-effectiveness is lower than BF. Technically, to make wastewater permeate membrane is against a law of nature. On the contrary BF follows a law of nature and expanding the limit of biological treatment technology to meet potential needs.

3. Examples of BF system

- **Tokushu Tokai Paper Co., Ltd (Old name: Tokai Pulp Co., Ltd)**

  BF system has been running for ten years with no clam even though the effluent flows into Oi River well-known by clear water, and no trouble has occurred even controlled by centralized monitoring system without operator. It was almost forgotten events that old system sometimes happened blockage of water flow and falling active sludge from contact material and took time to restore it. And there is unexpected effect that restart time requires only three days instead of 45 days the old system required. This innovative effect draws engineering company's attention as one of resilience technology

- **Emergency restoration measure for Minami Gamo sewage plant in Sendai city destroyed by the tsunami on 11th march 2011**

  BF system was selected as emergency restoration measure for Minami Gamo sewage plant destroyed the tsunami which height reached 10.4m. The period of restoration measure was as short time as eight months, until today the plant is operating without trouble. BF was installed an extra tank which was less damage, design BOD lord was 13kg-BOD/m3.day (material BOD lord was 17kg-BOD/m3.day). A lot of tissues ware included in influent because no pre-sedimentation tank. Concentration of BOD in influent was 200mg/L and effluent was 60mg/L, so that the removal ratio of BOD reached 70%. This system we called BF-SQ(Simple and Quick) contribute a lot to prevent the sea contamination.

4. Others

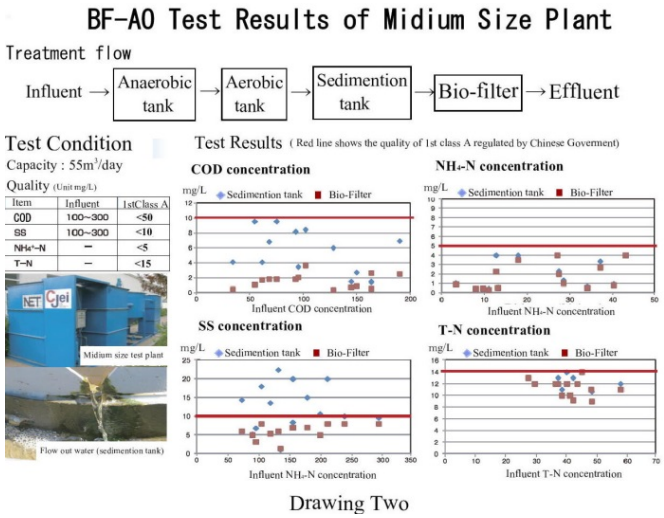
- **The test result of the Todoroki sewage treatment center**

  Todorki sewage treatment center carried out the BF system test for about two years using actual sewage influent. The result was that nitrification and oxidation took place simultaneously even existing BOD as opposed common knowledge. High removal rate of T-N and T-P were achieved. And also stable treatment was achieved even influent quality fluctuated five times from lowest to highest. So it was conformed that BF system has leap-frogging efficiency over conventional ASP (Active Sludge Process).

- **The test results of the Dalian Technology University in China**

  The Dalian Technology University carried out the BF systems both of a small and medium size using sewage and fishery mixed wastewater. Either test results were that effluent quality was stably better than

first class A regulated Chine Government. Drawing below shows the medium size test results.



Drawing Two

5. Market of Chinese Wastewater Treatment

BF system has been installed to modify a nitrogen removal system and an OD (Oxidation ditch). From this experience influence quality to sewage plant is rather stable and influence quantity fluctuates largely, so that sewage treatment is easier than industry wastewater which changes largely both quality and quantity and includes toxic substance. BF-SQ mentioned the case of Minami Gamo sewage plant can be applied to wide range of use in China for new plant as well as modifying existing plants. Furthermore NET offer another system named BF-UQ (Ultra Quick) which can treat low concentration water in very short time, so that can handle the contamination of lakes, marshes, and river. And also BF-SQ is fit to pretreatment for drinking water plant. We believe that this system will be to make "Newest Water" with further technology development. NET has become the best one in the world by the wide range of experiences by treated many organic wastewaters from many industries. NET also has possibility to be a new type of major water company by outsourcing excellent engineers and companies.

6. How to go forward BF from now

Many things surrounded our company all sides have prevented from wide use of BF. Especially following events are main obstacles.

- **The failure of own engineering company**

  NET established own engineering company and hired expert engineers. But the company made a loss and never made in black. So NET had to shut the company and huge debts remained. Still NET is struggling to come out from it. Main cause of this failure is that engineers were expert of their field but couldn't understand the innovative effects BF has. It is essential to get free from a prevailing notion when you use BF.

- **Power struggle inside Chinese Government**

  NET's tender for public sewage plant in China was accepted six years ago. But right before the contract, high ranking officer in Chinese Government was arrested. This event had an impact on this project, so that the contract was canceled. At same time the Senkaku- islands confliction suddenly broke out, so NET had to withdraw from China. NET will make oversee business only the nations having mature government.

7. Sorrow of small company (become a new types of a water major company by outsourcing)

NET will supports only national projects as a material supplier. Japanese water treatment industry, mature and the best in the world, should pay attention to BF's' innovative technology with high QCP system. And they have to apply BF to undeveloped area of wastewater discharged from various industries which considered it is impossible to treat by biological treatment. If this is put into practice, Japanese engineering companies will get an advantage over industrial wastewater treatment for oversea nations which regulations are imperfect, so that companies discharge wastewater to river without treatment. For oversea project, NET will make business with only the company which has good organization and understands innovative effects of BF under the condition that the projects get support from ODA (Official Development Assistance) I have heard the ODA can be applied to not only big companies but also small business. NET aims that BF system's return/investment ratio is 100% with high QCP and same time to get save energy. NET's dream is to get back wonderful nature while actively restore the nature.

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