Use of BactaServe Bioculture in Malaysia Based Adhesives Manufacturing Unit

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1. Background : -

This industry produces chemicals and adhesives. One of the biggest producers from Malaysia in this sector. Numerous chemicals that contribute to the high COD and BOD values in the influent and are challenging to degrade are employed during the production of adhesives. Adhesives are substances that increase the surface adhesion of bonded items. Unfortunately, they also emit volatile organic compounds (VOCs) which negatively impact upon human and animal health. VOCs have carcinogenic and mutagenic properties and can cause migraines, irritation to the eyes, nasal passages, mouth, lungs and respiratory problems.

Plant Specifications : -

168 m^3 of influent coming from the production plant has been treated in the ETP per day. The process scheme used for the treatment of such high COD and BOD is a two-stage Anaerobic treatment followed by a two-stage Aerobic treatment. Below are the capacities of the unit operations and processes used in this ETP.

TABLE 1 - Tank Size	Size (m^3)
EQ tank	100
Reaction Tank	200
Anaerobic Tank 1	50
Anaerobic Tank 2	50
Aerobic Tank 1	550
Aerobic Tank 2	550
Secondary clarifier	72

2. Challenges: -

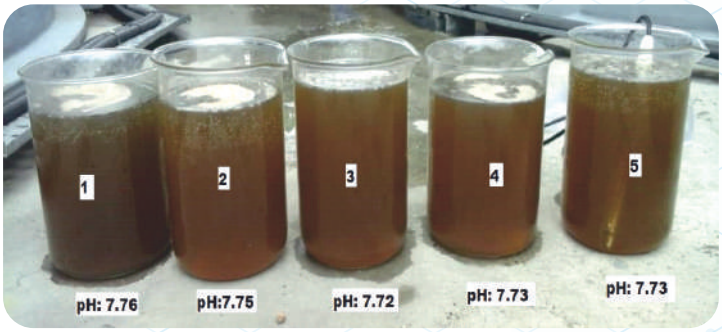
Many chemicals that contribute to the high COD BOD values in the influent and are challenging to degrade during the production of adhesives. Wastewater from adhesive production is characterized by high levels of pollutants and contains high concentrations of compounds including formaldehyde that are toxic.

Before adding bioculture, the reduction in COD BOD was very low even after 2-stage anaerobic and 2-stage aerobic treatment with very high retention times. The build-up of MLVSS in the aeration tank was very low. The client wanted higher percentege reduction of COD & BOD.

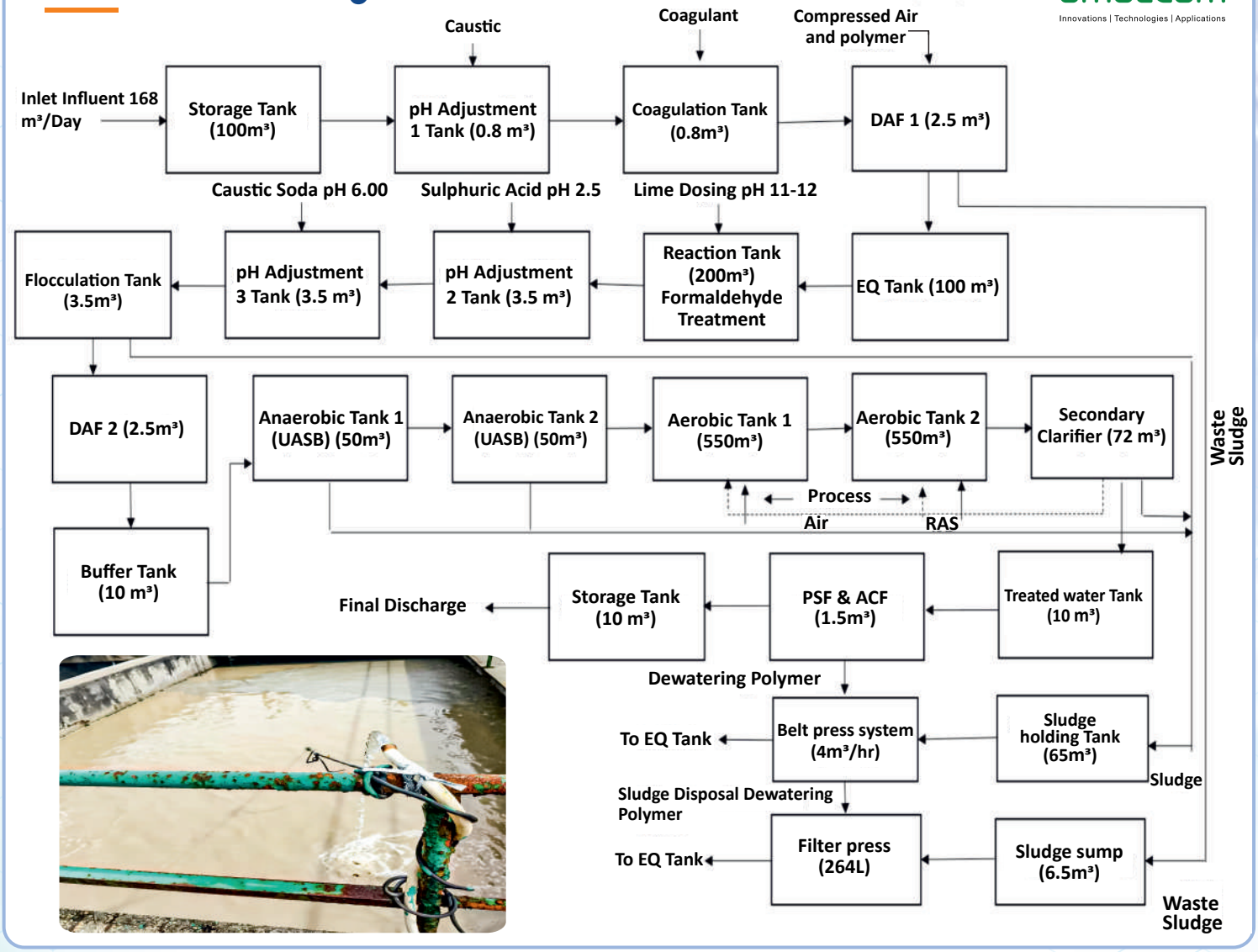
TABLE 2 - MLSS Before Bioculture

No.	Date	MLSS PPM	MLVSS	% MLVSS
1	17-Feb	2840	1221	43
2	19-Feb	2665	1093	41
3	21-Feb	2920	1139	39
4	23-Feb	2630	1131	43
5	25-Feb	2980	1311	44

Port Sample photograph of Anaerobic Digester



Process Flow Diagram :



3. Special Technical Solution: -

Based on the characteristics of the input and the contaminants that contribute to COD and BOD values, we advised employing "BactaServe- Aerobic & BactaServe- Anaerobic" to lower these values. In light of the burden, we advised them to take a higher concentration of bacterial Bioculture during the first two months of use. Following that, the bacterial Bioculture concentration was lowered as a maintenance dose for trouble-free and efficient operations, which eventually enhances the reduction in COD and BOD with a minimal amount of bacterial Bioculture being employed. When the system is stable, the same reduction in COD and BOD can be seen with less bacterial Bioculture being employed.

TABLE 3 DOSING PROTOCOL

Table 3.1 - BactaServe - Aerobic :

Sr. No.	Days	BactaServe - Aerobic Qty Dosed	Quantity
1	Day 01 to Day 10	4 kg / Day	40 kg
2	Day 11 to Day 20	3 kg / Day	30 kg
3	Day 21 to Day 30	2 kg / Day	20 kg
4	Day 31 to Day 60	1 kg / Day	30 kg
Total :			120 kg

Table 3.2 - BactaServe- Anaerobic :

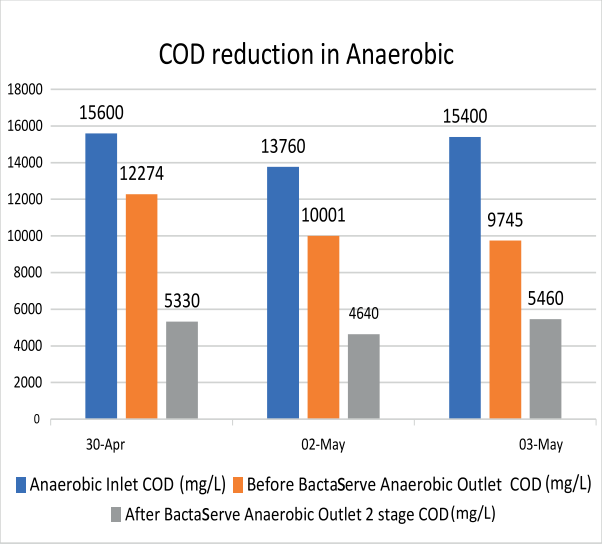
Sr. No.	Days	BactaServe - Anaerobic Qty Dosed	Quantity
1	Day 01 to Day 10	2 kg / Day	20 kg
2	Day 11 to Day 20	1 kg / Day	10 kg
3	Day 21 to Day 30	0.5 kg / Day	5 kg
4	Day 31 to Day 60	0.5 kg / Day	15 kg
Total :			50 kg

TABLE 4 Results : MLSS After bioculture

MLSS After Bioculture Addition

No.	Date	MLSS PPM	MLVSS	% MLVSS
1	01-May	4450	2937	66
2	08-May	4520	2848	63
3	15-May	4360	2834	65
4	22-May	4400	2904	66
5	29-May	4625	2960	64

TABLE 5 Results : COD Reduction achieved



Date	Anaerobic Inlet COD (mg/L)	Before BactaServe-Anaerobic Outlet COD (mg/L)	After BactaServe-Anaerobic Outlet COD (mg/L)	Before BactaServe-% COD Reduction across Anaerobic Digester	After BactaServe-% COD Reduction across Anaerobic Digester
30 Apr	15600	12274	5330	21.32	65.83
02 May	13760	10001	4640	27.32	66.28
03 May	15400	9745	5460	36.72	64.55

Date	Inlet to Aeration Tank COD (mg/L)	Before BactaServe-Outlet of Aeration Tank COD (mg/L)	After BactaServe-Outlet of Aeration Tank COD (mg/L)	Before BactaServe-% COD Reduction across Aeration Tank	After BactaServe-% COD Reduction across Aeration Tank
30 Apr	5330	3112	665	41.61	87.52
02 May	4640	2656	503	42.76	89.16
03 May	5460	3044	510	44.25	90.66

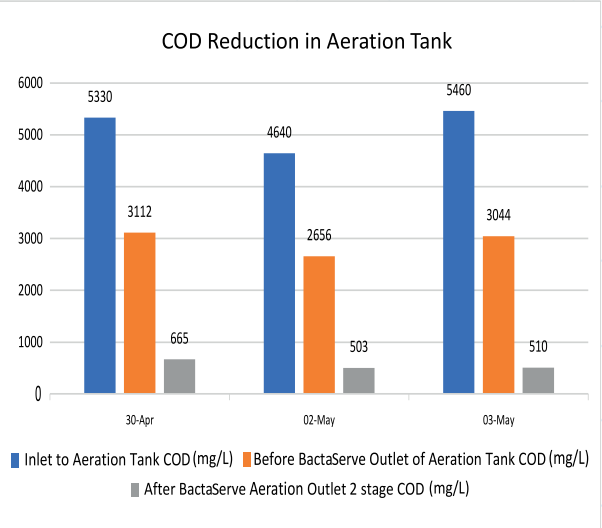
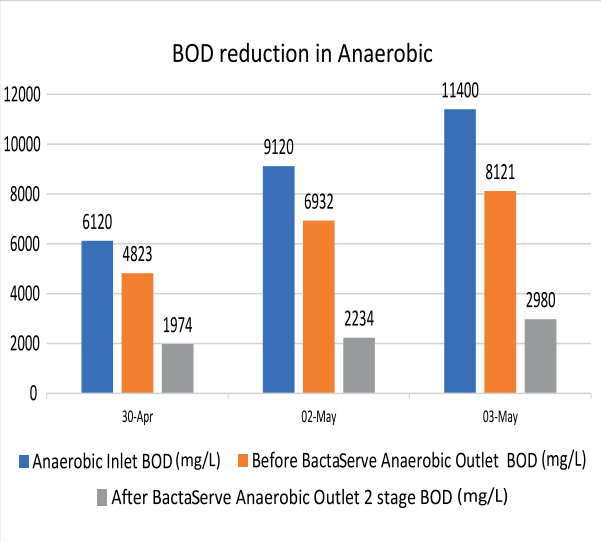
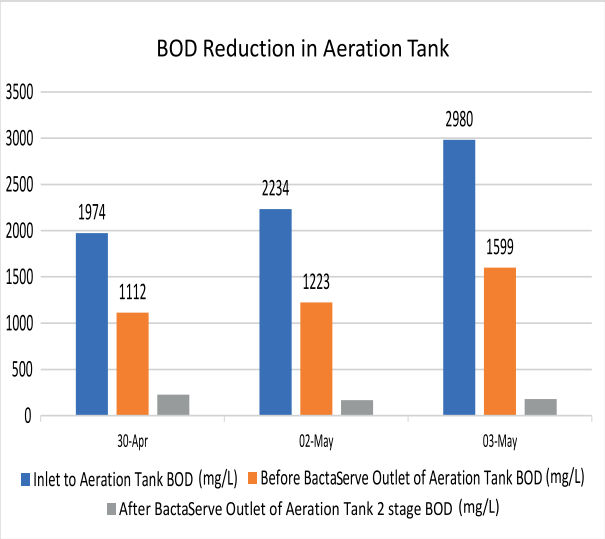


TABLE 6 Results : BOD Reduction achieved

Date	Anaerobic Inlet BOD (mg/L)	Before BactaServe- Anaerobic Outlet BOD (mg/L)	After BactaServe- Anaerobic Outlet BOD (mg/L)	Before BactaServe- % BOD Reduction across Anaerobic Digester	After BactaServe- % BOD Reduction across Anaerobic Digester
30 Apr	6120	4823	1974	21.19	67.74
02 May	9120	6932	2234	23.99	75.50
03 May	11400	8121	2980	28.76	73.86





Date	Inlet to Aeration Tank BOD (mg/L)	Before BactaServe- Outlet of Aeration Tank BOD (mg/L)	After BactaServe- Outlet of Aeration Tank BOD (mg/L)	Before BactaServe- % BOD Reduction across Aeration Tank	After BactaServe- % BOD Reduction across Aeration Tank
30 Apr	1974	1112	227	43.67	88.50
02 May	2234	1223	168	45.26	92.48
03 May	2980	1599	179	46.34	93.99

4. Executive Summary :

In this instance, we have dealt with significant COD and BOD in influent, which mostly results from the conversion of formaldehyde into reducing sugars, which are a combination of aldehyde and ketones-based chemicals.

Using "BactaServe - Aerobic and BactaServe- Anaerobic" bacterial Bioculture, we were able to combat excessive COD and BOD reduction. As the system becomes stabilized following the use of our specific bacterial Bioculture, the amount needed for dosage gradually reduces.

Special emphasis on the fact that Amalgam India through its Malaysian Channel Partner provided on-site telephonic and video conferencing based service to ensure results !