

Efficient Microbes For Effluent Treatment In Sugar Industry

Introduction

Thermax has been providing efficient microbes to various industries such as textile, food, chemical, pharmaceutical, paper and sugar for Effluent Treatment Process. One plant trial led Thermax to receive repeat order worth 1.5 tons for efficient microbes for consecutively two years.

In September 2020, one of the customers from sugar industry demanded cost reduction in existing product with same performance and thereby, R&D Biotech team innovated product with almost 65% cost reduction by formulation in raw material. Currently, the customer is using Thermax EMBC culture and achieving satisfactory results in the reduction of Chemical Oxygen Demand (COD) and odour in the effluent treatment process.

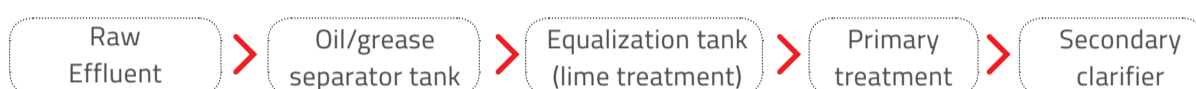


Challenges

UNIT-1: ETP has 350m³ aeration tank with surface aeration provision. The raw effluent is first taken into oil/grease separator tank, then enters equalization tank (lime treatment) followed by primary treatment where insoluble sludge is separated to get clear effluent which enters aeration tank. After the aeration tank, treated effluent goes into secondary clarifier. An online monitoring system is equipped to control and monitor. The expectation is to reduce COD further.

UNIT-2: All other features as unit 1. The Aeration tank capacity is 1350 m³ with diffusion type of aeration. The online monitoring system is equipped to control and monitor. The customer was facing a problem of blackish sludge in some areas of the aeration tank within 2-3 months of operation along with odour issues. The inadequate diffusion of air in the particular region could be the reason according to the customer. The expectation is to reduce COD further with an additional contribution of odour elimination.

ETP Plant Layout



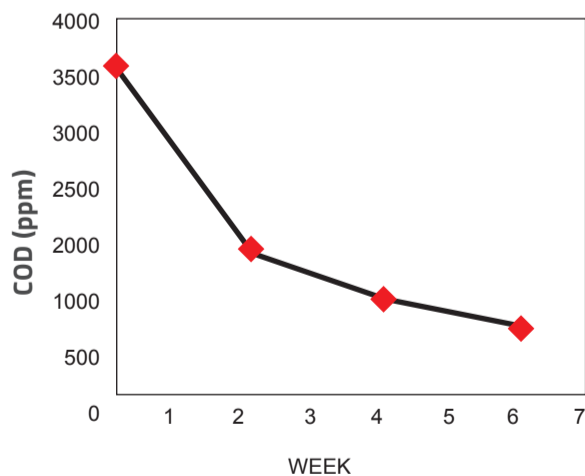
Effluent Characteristics	
Unit-1	Unit-2
COD: 8000 ppm	COD: 1200-1800 ppm
BOD: 4200 ppm	BOD: 600-700 ppm
Ingredients: Mainly sugar, process water	Ingredients: Mainly sugar, process water
Color: Blackish	Color: Blackish
pH: 5.0-6.5	pH: 6.5-7.0
TDS: 1600 ppm	TDS: 550 ppm
TSS: 300 ppm	TSS: 1200-1400 ppm
Effluent flow rate: 15-17 m ³ /hr	Effluent flow rate: 15-30 m ³ /hr

Thermax Solution

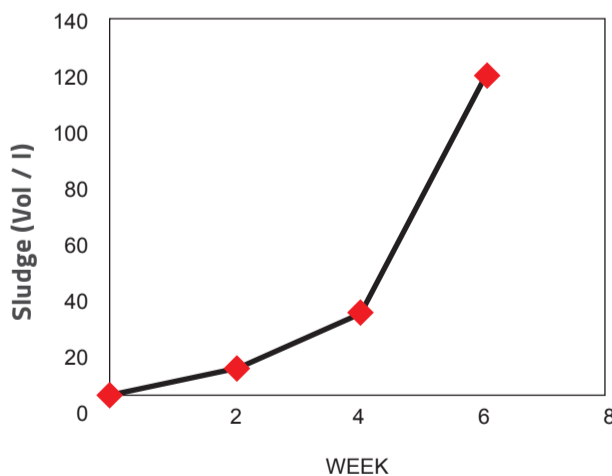
UNIT-1: Since, the plant required a complete revamp, the following solution was provided. Till the time when the aeration tank gets filled with the effluent, 50 kg of Maxgreen-EMBC-PH-002 was taken into each 150 L effluent and continuously aerated (manual agitation) for 2 days. As such, 4 sets of 200 L were kept ready. Urea and DAP 0.5 kg each were added daily. First, 2 sets of 200 L to be dosed in the filled aeration tank (i.e. 350 m³, where surface aeration was fully operational). Further, 2 Sets of 200 L were added after 4-5 days. Urea and DAP 2-3 kg were each added daily to the aeration tank. The motive was to increase activated sludge concentration in the aeration tank. Further, the addition of EMBC was recommended depending upon the initial performance.

UNIT-2: Similar to UNIT-1, second plant i.e. UNIT-2 also required complete revamp. Thus, following solution was provided. 90 kg of Maxgreen-EMBC-PH-002 was taken into 400 L effluent and continuously aerated by diffused aeration for 2 days. As such, 2 Sets of each 500 L were kept ready. Urea and DAP 0.5 kg each were added daily. Meanwhile, the aeration tank was allowed to fill completely with the effluent obtained as per daily production. The aeration tank was well provided with diffused aeration. The first set of 500 L was dosed into the aeration tank when half-filled (around 600 m³). The other set of 500 L was when the aeration tank was about to completely fill by the effluent (i.e. at around 90%). Further, the addition of EMBC was recommended depending upon the initial performance.

Observations



COD profile after addition of Maxgreen-EMBC-PH-002 at UNIT-1

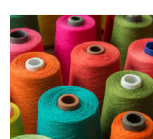


Sludge volume profile after addition of Maxgreen-EMBC-PH-002 at UNIT-1

Results

- Slight yellowish-white clear effluent water at the outlet. Initially, water was slight blackish in colour at both the units.
- No smell from the aeration tank especially at UNIT-2 where this problem was prevalent earlier.
- No black sludge formation in UNIT-2 aeration tank where this problem was prevalent earlier.
- The pH of the water is around 7.0-7.5 at the outlet.
- The COD reduction at UNIT-2 has been increased meeting the requirements of PCB norms after addition of Maxgreen-EMBC-PH-002. Now, the COD at the outlet is around 50-60 ppm compared to 80-90 ppm observed earlier.
- Overall, the customer is satisfied with the performance of Maxgreen-EMBC-PH-002 by far.

Industries We Serve



Textile



Food & Beverages



Chemicals



Pharmaceuticals



Paper



Sugar