

Trial Results of Decanter for Effluent Treatment

All the distillery effluents contain relatively small quantities of suspended solids but are nevertheless unsuitable for direct discharge to drain.

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A typical distillery plant consists of a biomethanation plant followed by the secondary treatment plant. The suspended solids are separated usually after pH correction and addition of flocculent.

Clarified effluent is generally discharged to drain while the underflow of the clarifier needs further concentration before disposal. Alfa Level's Decanter Centrifuge is ideally suited for this duty, manufactured with all contact parts in stainless steel. It is particularly a rugged machine and capable of operating continuously under the arduous conditions often experienced in this kind of plants.

Dewatering Trials:

Dewatering trials were conducted for the anaerobically digested secondary effluent sludge of M/s. India Glycol Ltd., Kashipur. The results of the trials are quite significant and the performance obtained has been tabulated in the Table shown above.

Units Performance:

The Underflow of the clarifier had inlet solids ranging between 2.5% w/w to 4% w/w. The average inlet solids were found to be in the range of about 3.5% w/w. The trial was conducted with two different combinations of bowl speed and differential speed:

- a) 3250 rpm/7.6 rpm
- b) 4000 rpm/9.4 rpm

Actual Trial Results							
rpm/ disp	Feed rate m ³ /hr	Inlet solids (%w/w)	Solid loading (Kgs)	Poly dose (ppm)	Cake solids (%w/w)	Recovery (%)	Poly consumption (Kg/Ton of dry solids)
3250/7.6	8.50	3.50	297.50	NIL	NIL	0.00	NIL
3250/7.6	8.50	3.50	297.50	55.00	42.00	95.00	1.70
4000/9.4	8.50	3.50	297.50	NIL	54.50	69.00	NIL
4000/9.4	8.50	3.50	297.50	20.00	45.00	75.00	0.60

Typical Flow rates/ Performance data for 400 series Decanters						
Model	Bowl rpm	Feed rate m ³ /hr.	Inlet solids (% w/w)	Cake solids (% w/w)	Recovery (% w/w)	Poly Cons (Kg/Ton)
NX 4050	3250	10.0	2.5 to 3.5	38 to 42	90 to 95	1.7 to 2.0
NX 4050	4000	10.0	2.5 to 3.5	53 to 56	64 to 69	NIL to 0.6
NX 4040	3250	6.0	2.5 to 3.5	38 to 42	90 to 95	1.7 to 2.0
NX 4040	4000	6.0	2.5 to 3.5	53 to 56	64 to 69	NIL to 0.6
NX 4030	3250	4.0	2.5 to 3.5	38 to 42	90 to 95	1.7 to 2.0
NX 4030	4000	4.0	2.5 to 3.5	53 to 56	64 to 69	NIL to 0.6

The feed flow rates were kept in the range of 7.5 to 8.5 m³/hr. With average inlet solids of 3.5% w/w. The solids input to decanter on dry basis was about 35 kg/m³ of effluent. Likewise for the feed of 8.5 m³/hr, the total input of solids was 298 Kg/hr.

With combination 'a' as mentioned above and without polyelectrolyte dosing, no cake was obtained. Hence, a suitable polyelectrolyte was selected and was dosed along with the effluent inlet. With dosage of polyelectrolyte at this combination, gave good results in the recovery of solids in cake. The polyelectrolyte dosage were varied for various dosage rates and a suitable dosage level was obtained. Polyelectrolyte dosage @ 55 ppm was found to optimum, which gave recovery of solids in cake in the range of 90% to 95% and cake dryness in the range of 38% w/w to 44% w/w. The current drawn in this case was 23 Amps.

With combination 'b' as mentioned above, the trial was conducted without polyelectrolyte dosing. With average inlet solids of 3.5% w/w, the cake dryness obtained was in the range of 53% w/w to 56% w/w, with recovery of solids in the range of 64% to 69%. The current drawn in this case was 25 Amps.

With the same combination the polyelectrolyte was dosed at various dosage rates and it was observed that at optimum dosage of 20 ppm, the results obtained were better. The cake dryness of 45% w/w was obtained with recovery of 76%. With the results obtained from the said trial, various models can be offered to customers depending upon the need and requirement at various effluent handling capacities.

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Reference Book:

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