

Dairy acidulation, ice cream production

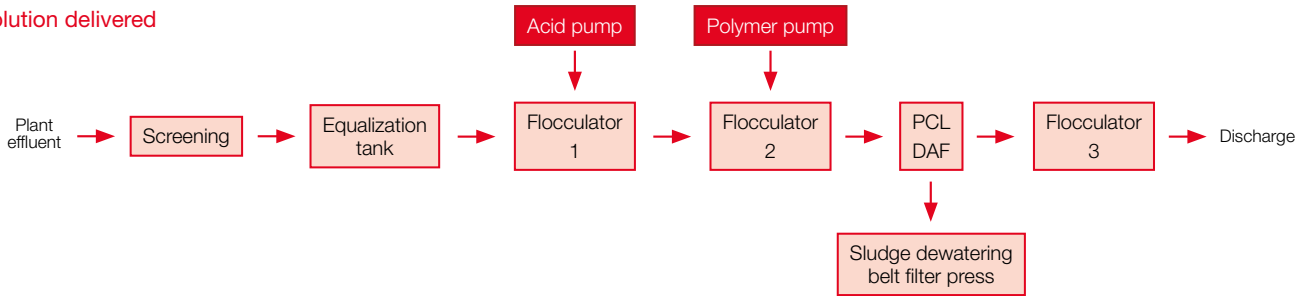
The ice cream production plant runs multiple products in a single day. Between each product run a CIP system is used to wash equipment of any number of organic ingredients from chocolate and caramel to fruit paste, nuts and more. The resulting wastewater contains high loads of TSS, FOG, and a wildly fluctuating pH.

The delivered wastewater treatment solution utilizes an acidulation process. By dosing sulfuric acid to lower the pH below 4, oil emulsions are broken, allowing polymers to effectively agglomerate suspended solids instead of relying on traditional coagulation and flocculation chemistry.

After removing solids caustic soda is used to neutralize the pH before discharge. This approach simplifies the chemical process and achieves discharge requirements.



Solution delivered



Equipment supplied

- PCL-180 DAF
- Flocculator (3)
- Rotary drum screen
- Sludge dewatering belt filter press

DAF sizing calculations

Hydraulic surface loading rate

$$= \frac{\text{Feed flow + recycle flow in m}^3/\text{h}}{\text{Effective surface area in m}^2}$$

$$= \frac{227.1 + 36.3 \text{ m}^3/\text{h}}{x \text{ m}^2} = 2.44 \text{ m}^3/\text{m}^2/\text{h}$$

$$= 108 \text{ m}^2 \text{ required}$$

Solids loading rate

$$= \frac{\text{Weight of TSS in feed in kg/h}}{\text{Free surface area in m}^2}$$

$$= \frac{340 \text{ kg/h}}{x \text{ m}^2} = 36.6 \text{ kg/m}^2/\text{h}$$

$$= 9.3 \text{ m}^2 \text{ required}$$

	Design parameters	Discharge requirements
Flow	5,451 m ³ /d	
TSS	1'500 mg/l	250 mg/l
FOG	250 mg/l	100 mg/l
pH	4 - 10	6.5 - 8.5

