

A.T.E. helps Repute Engineers save with Yamada AODD pumps

Clean-In-Place (CIP) systems are critical to the operation of process equipment fulfilling demanding duty conditions. Most CIP systems will need to transfer highly concentrated chemicals to balance tanks. A.T.E. has provided state-of-the-art solutions with air operated double diaphragm pumping technology for such hazardous chemical transfer applications.

Background

Repute Engineers Private Ltd, established in 1998, supports the engineering needs of the food processing industry. Repute manufactures critical process equipment and systems and with these has supplied around 1000 CIP (Clean-In-Place) systems till date.

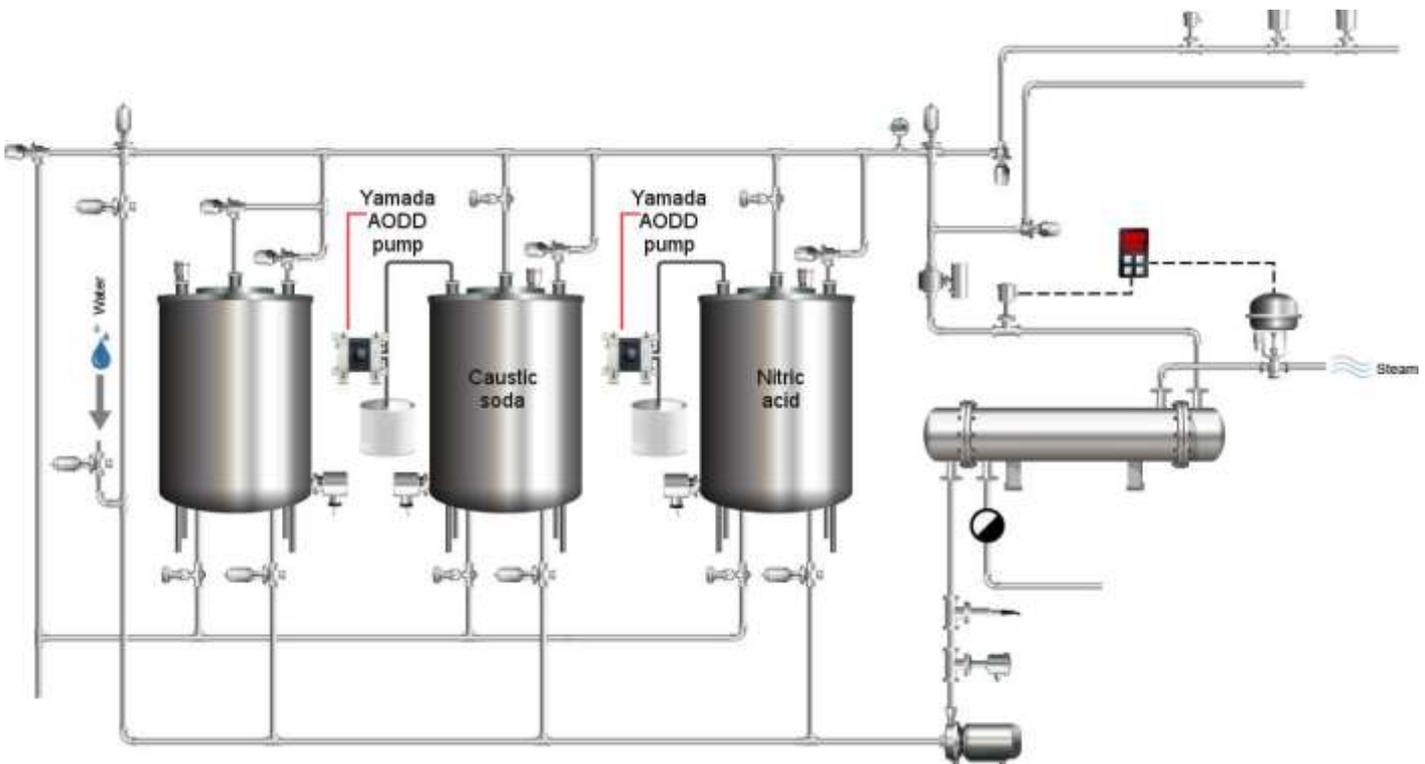
A CIP system cleans and disinfects processing plants. It consists of a balance tank, pump, and a connection to the plant being cleaned. A CIP system is a critical component of any food processing equipment, as it's only through a reliable CIP system that hygiene can be assured.

Challenges

Repute Engineers was using piston pumps to transfer concentrated (50%) caustic soda and nitric acid to the CIP balance tanks. The problem with the use of piston pumps in this application was that when piston pumps run dry, there is wear on the seals as there is no lubrication between seal faces. This caused premature failure of seals leading to down time and ultimately, loss of product, production, and profit. Repute Engineers turned to A.T.E. for a solution for this problem.

The solution

A.T.E.'s engineers calculated the desired flow rate and potential pressure conditions and suggested using a Yamada AODD pump in the CIP system.



Schematic of CIP system

The flow rate of an AODD pump can be easily adjusted by choosing the diameter and stroke length of the diaphragm. The material of construction (or MoC) chosen was a synthetic fluoropolymer of tetrafluoroethylene – a material that is highly resistant to heat, acids, alkalis, and oxidising agents.

A standard CIP system transfers 250 litres of acid or alkali per hour to the balance tank in one cycle of operation. The Yamada AODD pumps helped Repute Engineers save 17% of acid/alkali per cycle, as shown below:

Alkali/acid transfer pump	Piston pump	Yamada AODD pump	Saving per cycle	% Saving per cycle
	(A)	(B)	(A-B)	(A-B)/A
Flow rate (LPM)	5	4.17	0.83	17%

In addition, there are many more benefits with Yamada AODD pumps, which are:

1. Leak-proof: AODD pumps are seal-less pumps and are able to run dry, resulting in longer pump life.
2. Reduced maintenance: AODD pumps are constructed using a simple design, with minimal moving parts and thus have lower maintenance requirements.

Safety: AODD pumps need only compressed air for operation. There are no motors with the pumps and no electric supply is required, which make the AODD pumps safe to use around hazardous chemicals.

Repute Engineers was very happy with the results. This prompted Mr Sanjeev S Halbhavi, Director – Engineering, Repute Engineering, to say, *"Over the years, we have tried all sorts of pumps for caustic and nitric acid transfer application, but we have found in the last eight years that Yamada really uses the highest quality of materials in their pumps and these pumps have been proven to last in all situations, and we really trust them in our tank-cleaning systems."*