

Double Delivery Pumps for Phosphoric Acid Slurry - A Case study

How Zuari Agro Chemicals Ltd., benefited from using a double delivery cantilever pump to pump troublesome phosphoric acid slurry and overcame frequent breakdown issues leading to revenue losses.



About the Company:

Zuari Agro Chemicals (ZACL) is a flagship company of Adventz Group. They are the market leaders in manufacturing of complex Fertilisers. Adventz is a diversified conglomerate with four major industry verticals- Agriculture, Engineering & Infra, Lifestyle & Real Estate and Services. ZACL is located at Goa near Dabolim airport.

Process:

In the process of manufacture of fertilisers, phosphoric acid made from rock phosphate slurry plays a crucial role. The phosphoric acid laden with fine slurry needs to be pumped to various locations in the plant.



Problems faced by ZACL:

ZACL were using imported end suction horizontal process pumps for handling slurry. The downtime between the plant maintenance was high. They were facing following problems:

- Heavy leakages through mechanical seal
- Priming problems
- Breaking of seal faces due to dry running
- Environmental issues due to heavy leakages
- Heavy production loss
- Choking of slurry when the pump is restarted

Solution offered by KISHOR:

KISHOR PUMPS approached ZACK with the permanent solution to above problems faced by them. KISHOR PUMPS visited the site to study the application and provide solution to the problems faced. KISHOR PUMPS proposed a cantilever vertical double delivery pump in duplex stainless steel material to ZACL and explained them the advantages by going for this pump. The following advantages were envisioned by KISHOR PUMPS for ZACL:

- Being a vertical submerged pump, gland packing/mechanical seal was not required.
- The impeller is always submerged in the liquid therefore priming is eliminated.
- Being double delivery, radial thrust is balanced which eliminates the need for having intermediate support wet bearings in the column shaft. This was critical since it was a slurry application.
- Being a cantilever design pump, intermediate bushes are eliminated and hence no external flushing is required.
- Self-draining.
- Due to balanced hydraulics, there was no restriction on the duty point of the pump. This was important consideration for ZACL since this was particularly a transfer duty application wherein the duty point of the pump may change and shift away from the best efficiency point (BEP).



ZACL was convinced and KISHOR PUMPS got the order for double delivery pump in the year 2008 and the pump was commissioned successfully. ZACL is satisfied with the performance of the pump and since last 10 years the pumps are running trouble free.

ZACL has issued a performance certificate to KISHOR for double delivery pumps working in phosphoric acid plant supplied in duplex stainless steel metallurgy.

Plant: 100 TPD Phosphoric Acid Plant

Liquid: 54% Phosphoric Acid + Gypsum Slurry

Material: CD 4MCu, pipes in SS 904L

Pump installation depth: 1.8 m

Flow rate: 80 m³/hr

Head: 25 m