SULZER

Sulzer Pumps

Case Study

SALOMIX® Vertical Agitator, the Perfect Choice for a Storage Tank in Phosphoric Acid Production

SALOMIX® LV-11/71 Agitator

The Sulzer Difference

SALOMIX® LV agitator is well suited to storage applications. The vertical downflow minimizes shaft vibrations and unloads the drive. The shaft design fulfills all key requirements: straightness and rigidness. The paddles with an adjustable position, have a reliable fixing system on the hollow shaft. It is convenient to assemble the agitator. The general agitator design provides low power consumption and decreases the customer's costs.

Project Highlights

In the phosphoric acid manufacturing process, storage tanks are used in every mill. After reaction and filtration, phosphoric acid is pumped into the storage. Phosphoric acid also contains some sulphuric acid and fluorine. It is quite aggressive. In addition, without agitation, the gypsum (partly dissolved) settles and crystallizes. This is why good mixing is needed. After storage, phosphoric acid goes to fertilizer production. Usually there are several storages operating continuously, and often the storage level is not constant. The agitator in the storage tank aims to prevent the sedimentation of gypsum particles; otherwise the particles settle on the bottom, requiring the cleaning of walls and tanks.

The Challenge

The agitator in the phosphoric acid storage tank is required to perform effective mixing, preventing sedimentation. Simultaneously, the agitator with a long shaft (approximately 10 m and longer) should not have a bottom bearing, it should be efficient (low power consumption), and have low speed. The construction of the wetted parts is important, too. Depending on the process type, the agitator material of the wetted parts is 4T or 4U (or similar).

The Solution

SALOMIX® LV agitator with paddles of AF type on one level meets the customer's all requirements. The paddles are quite large (up to 3.8 m in diameter), while the agitator speed is low. The low speed minimizes radial forces. The paddles are located low at the tank bottom, so the customer can pump out all acid with agitation if needed.

Customer Benefits

Sulzer SALOMIX® LV agitator with AF paddles can operate very long without any problems, and without needing frequent maintenance. The shaft construction (not heavy pipe - large diameter) provides straightness. The agitation arrangement makes it possible to unload the gear and minimizes the absorbed power. The combination of all correct design solutions together with the correct material selection of the wetted parts gives a reliable and long-lasting product. As an option, the agitators can have a cone with windows between the gear foot and tank (or frame) to observe the condition of the connection between the coupling half and the shaft flange.

Contact

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Applicable Markets

Fertilizer Industry

Applicable Products

SALOMIX® Agitators

Agitator Data

Agitator	SALOMIX® LV-11/71 vertical agitator, ser. no. 100026055
Material	Avesta 654 SMO
Propeller	AF, 1 level, D=3200 mm
Speed	21 rpm
Motor	11 kW, Kumera gear

Process Data

Phosphoric acid slurry

P_2O_5	37-39% (H_3PO_4)
SO_3	2% (H_2SO_4)
F	2% (HF, H_2SiF_6)
Temperature	90 °C
Solids	1.5%
Specific gravity	1430 kg/m^3