

## Phosphoric acid attack tank with SALOMIX L vertical agitators

---

Many vertical agitators are used in the production of phosphoric acid, where the attack tank is the most demanding and critical application. The agitators are to provide intensive mixing to ensure a proper attack of phosphate rock by sulfuric acid. They must also prevent the solids from settling, and very often they also limit foaming. The slurry contains about 25-40% of solids and is extremely aggressive due to the mixture of acids, high temperature, and the abrasive solids.



## The challenge

The requirements for agitators in attack tanks are strict. The wetted parts must be corrosion resistant and the blades must be abrasion resistant to achieve maximum blade lifetime. The efficiency of the agitator must be high for low power consumption, and the agitator must be of heavy-duty design for high reliability. The customer earlier had a heavy agitator with low efficiency and short lifetime of the wetted parts.

The agitators in attack tanks must be reliable and durable. Maintenance operations are time consuming and have a direct impact on production. The wetted parts must be corrosion resistant and the blades must be abrasion resistant to achieve maximum lifetime. In addition, a high-efficiency agitator will reduce power consumption and save operating cost. The agitator must be of heavy-duty design with extensive mechanical safety factors for higher reliability. The customer earlier had heavy, but poorly engineered agitators with low efficiency and short lifetime of the wetted parts.



For any inquiries please contact

[info\\_fmncpi@sulzer.com](mailto:info_fmncpi@sulzer.com)

[sulzer.com](https://www.sulzer.com)

## The solution

Sulzer provided an optimized solution with a SALOMIX L agitator with a heavy-duty bearing frame and two levels of MX3 blades. The SALOMIX agitator has three times less weight and a better efficiency. Given its optimal design, a longer lifetime of the wetted parts than in the previous one is expected. The agitator is equipped with an SEW gear and an ABB motor. The design allows blade angle adjustment, which is used by the customer to optimize the process performance.

## Customer benefits

The use of SALOMIX L agitator with MX3 propellers provides long-lasting and trouble-free operation. The lifetime of the blades is about 3-4 years, compared to one year previously. The customer got a reliable and low-maintenance product, small electricity bill and high process efficiency.

## The Sulzer difference

SALOMIX L agitator with gear drive, strong bearing unit and cast blades meets the requirements of heavy-duty use. The shaft consists of two parts (upper part hollow, lower part solid), and the tank is effectively sealed off with a Garlock lip seal. The agitator features a vertical downflow, minimizes shaft vibrations and unloads the drive.

## Agitator data

Agitator	SALOMIX L140.G vertical agitator
Material	4U, Avesta 654 SMO
Propeller	MX3, 2 levels, D=1'250 mm
Speed	106 rpm
Motor	55 kW, SEW gear

## Process data

Phosphoric acid slurry	
P2O5	37-39% (H <sub>3</sub> PO <sub>4</sub> )
SO3	4% (H <sub>2</sub> SO <sub>4</sub> )
F	2% (HF, H <sub>2</sub> SIF <sub>6</sub> )
Temperature	100°C
Solids	30%
Specific gravity	1'600 kg/m <sup>3</sup>

A10083 en 9.2024, Copyright © Sulzer Ltd 2024

This case study is a general product presentation. It does not provide a warranty or guarantee of any kind. Please contact us for a description of the warranties and guarantees offered with our products. Directions for use and safety will be given separately. All information herein is subject to change without notice.