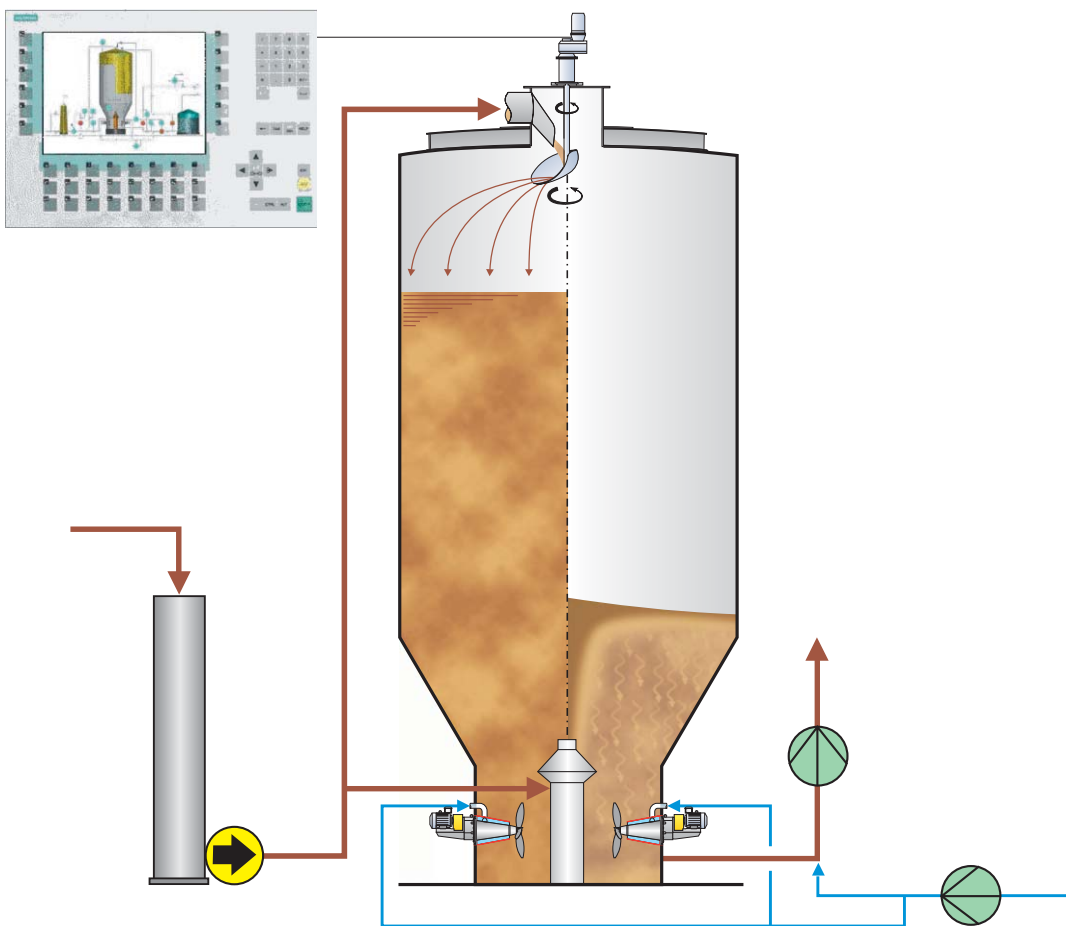


## TMS – Tower Management System



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The **Heart**  
of Your  
Process

# The New Sulzer Pumps TMS – Tower Management System for th

Do you have storage tower related problems? Is the retention time of your storage tower insufficient? Do you suspect that your tower is channelling? Do you suffer from occasional unexplained consistency variations? Do you have problems with air or bacteria in the pulp? Do you want to run a big storage tower with a high production rate and you need low discharge consistency variations? Do you need a high consistency storage tower with a low consistency discharge? Do you have pulp quality related problems? Are you running a storage tower with a low pulp level and want to save energy in pumping?

If your answer is yes to any of the above questions, then Sulzer Pumps' Tower Management System could help you and your process.

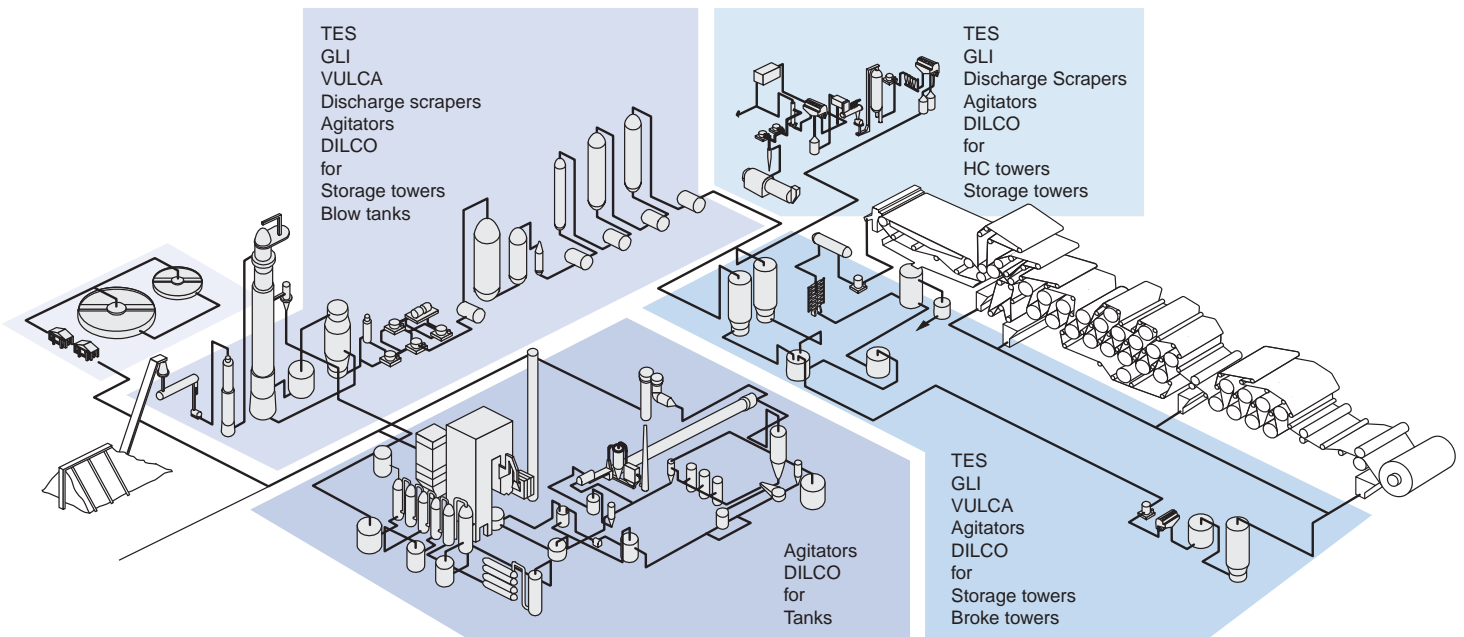
The new Sulzer Pumps TMS Tower Management System controls all pumping and mixing requirements in tower process applications, and is based on proven, innovative solutions and products.

Sulzer Pumps' Tower Management System is designed for improving the performance of any kind of tower, regardless of inlet or storage consistency, shape or size. The system can be utilized with straight towers, such as high consistency bleaching and storage towers, reduced bottom medium consistency storage towers, blow tanks, low consistency broke towers, and more.

Sulzer Pumps has a unique understanding of the pulp and paper industry's agitation processes. With more than 30 years experience within PPI, we have the skills and the knowledge to meet the challenges and needs of today's agitation and mixing tasks.

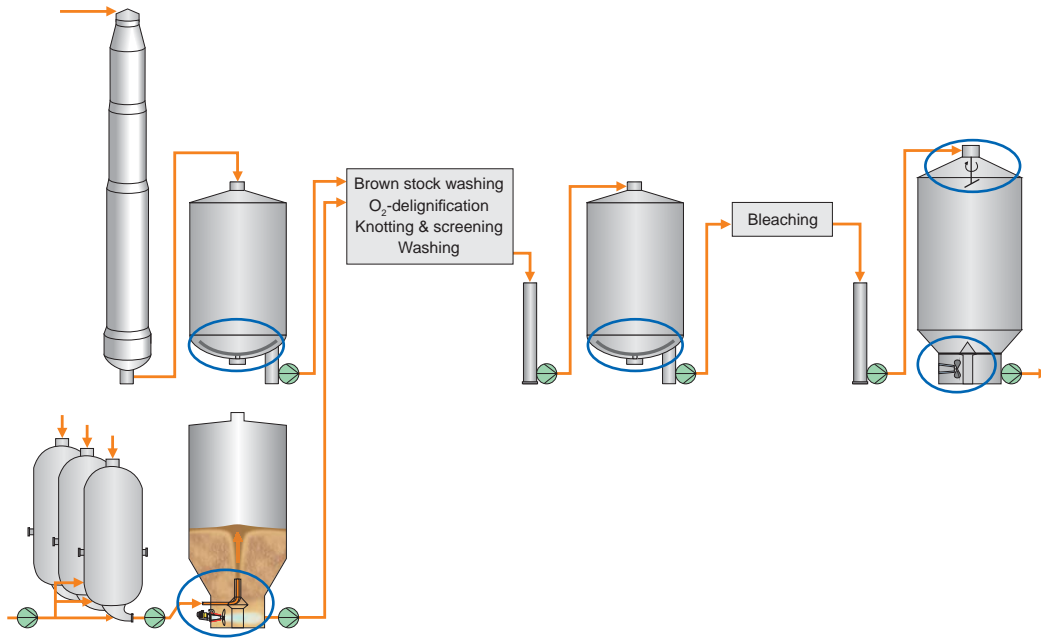


## Tower Management Systems in PPI Processes

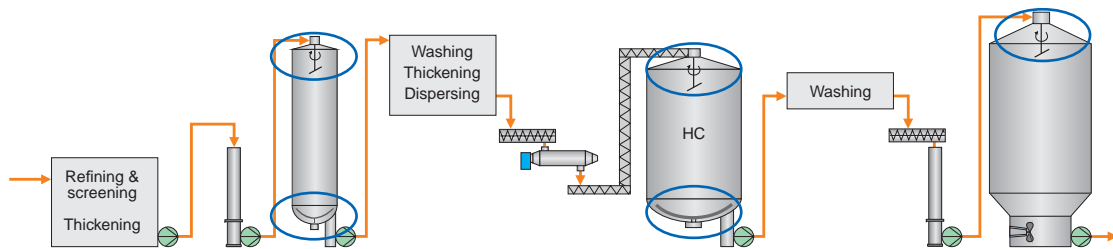


# The Pulp and Paper Industry

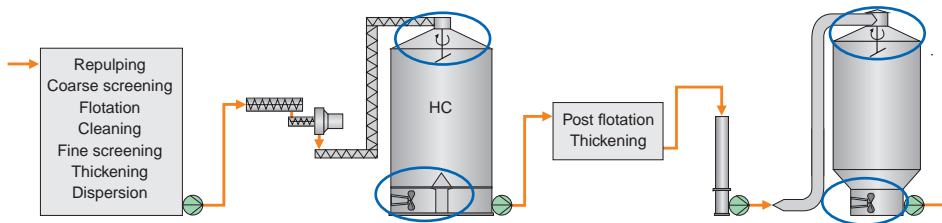
## TMS in chemical pulp mills



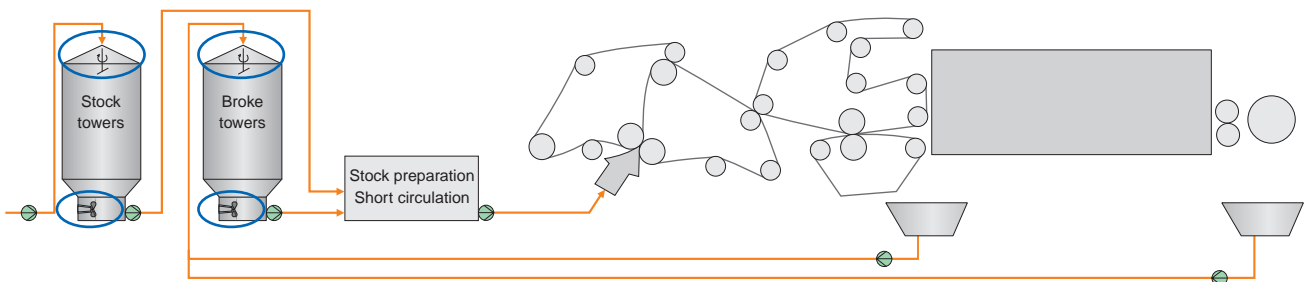
## TMS in mechanical pulp mills



## TMS in recycled fiber lines



## TMS in paper mills



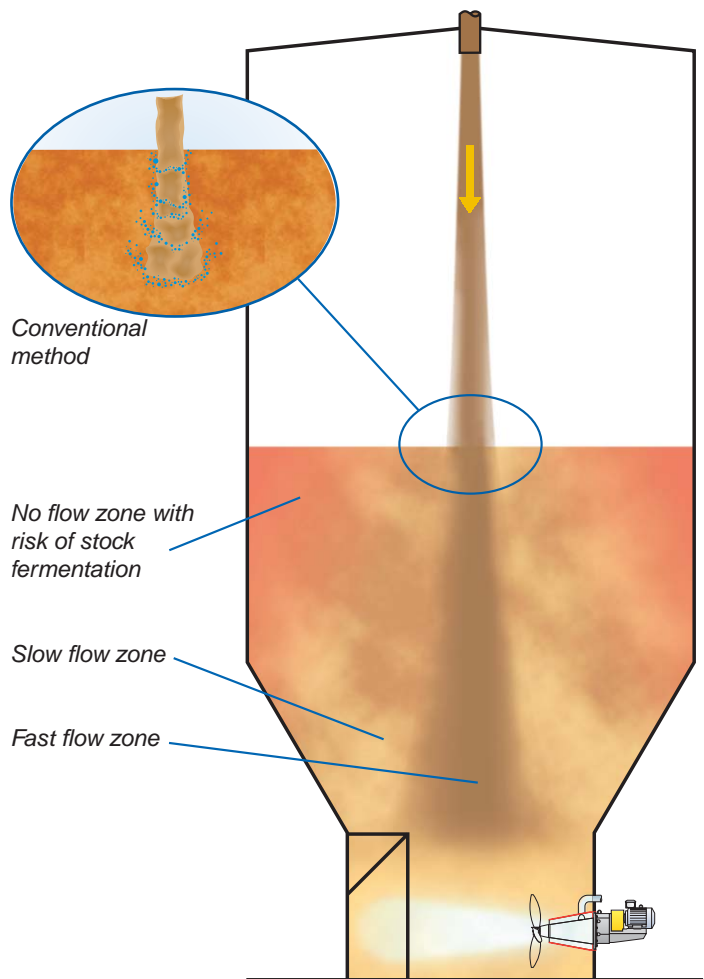
## Examples of Problems in Storage Towers

When a storage tower is charged through the roof in the conventional way, channelling can easily occur with stagnant areas developing in the storage zone. The active storage capacity of the tower is, therefore, reduced. Furthermore, severe uncontrollable consistency variations can result from lumps of high consistency stock working loose from the stagnant zone and falling into the agitation zone. In addition, air is entrained into the stock in the conventional charging method.

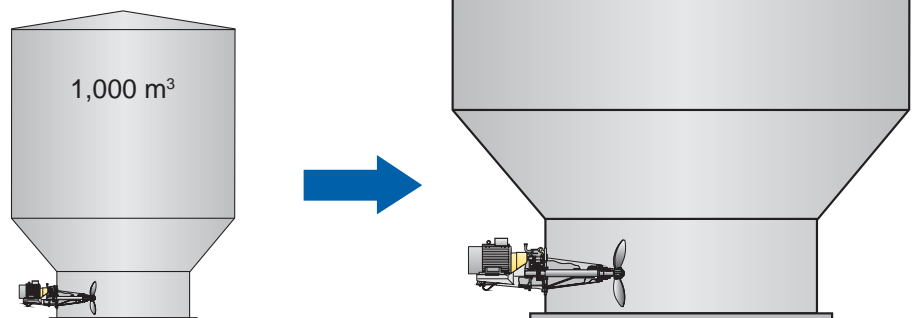
In certain towers in pulp and paper mills, only a part of the storage capacity is utilized. The broke tower is a typical example, with the broke being dropped down to the bottom. Additionally, a stagnant zone develops in the areas around the fast flowing zone in the middle. Air is entrained into the stock.

### These examples result in economical and ecological losses

- due to lowered quality,
- lost production, and
- the increased consumption of raw materials and energy.



**Production rates and tower sizes are ever increasing.** Therefore, a conventional storage tower agitation zone with a single agitator can no longer be guaranteed to secure good performance and stable consistency in the tower's discharge.



# Our Solutions to Your Storage Tower Problems

## SALOMIX® TES Top Entry Spreader

TES spreads stock evenly on the top surface to control the flow in the upper medium or high consistency part of the tower. The quality of the discharged stock remains good.

### Benefits:

- Creates a uniform continuous downflow, with no stagnant zones.
- The variable rotating speed always spreads a fresh top layer of stock, regardless of the surface level.
- Prevents channelling and air entrainment into the stock.

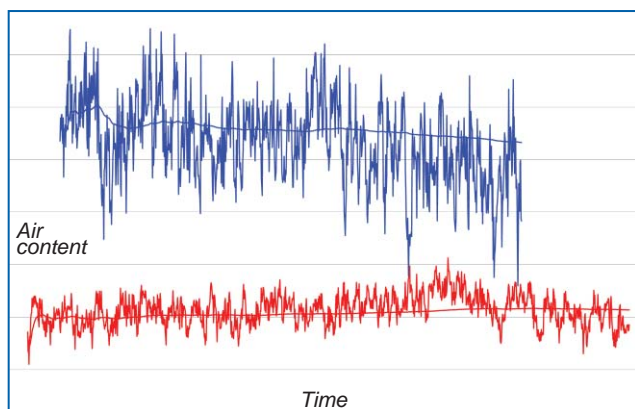
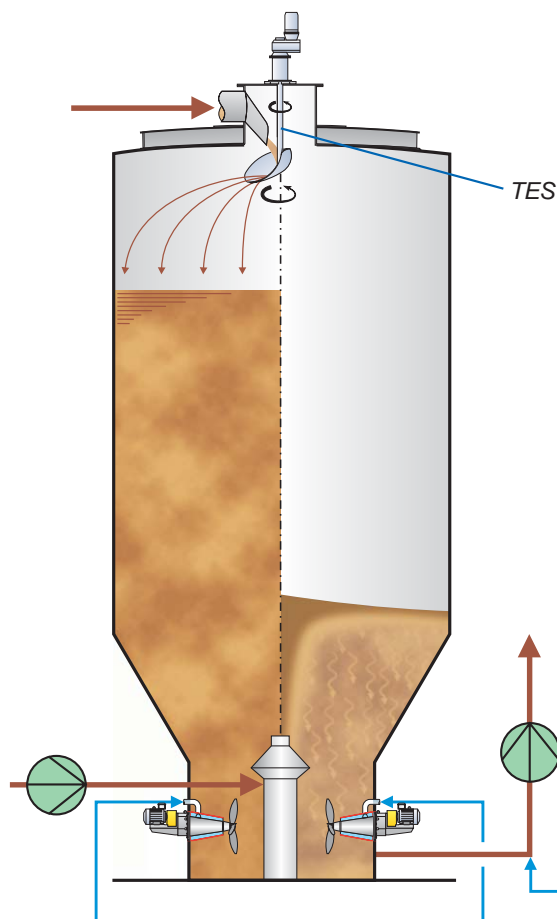
### Customer case:

#### TES solves problems with retention time

A mill had problems with a 2000 m<sup>3</sup> storage tower, the upper diameter of which is 12 m, and the bottom diameter 6,5 m. The theoretical retention time of the tower is approximately 4 hours with a full stock level. The actual retention time before installation of the TES was less than 2 hours.

Test run results show clearly how TES helps the tower to operate with the correct retention time:

|                                 |            |            |
|---------------------------------|------------|------------|
| Tower level                     | 89%        | 59%        |
| Measured average retention time | 4 h 10 min | 2 h 10 min |
| Theoretical retention time      | 4 h 24 min | 2 h 16 min |



### Customer case:

#### TES solves problems with entrained air

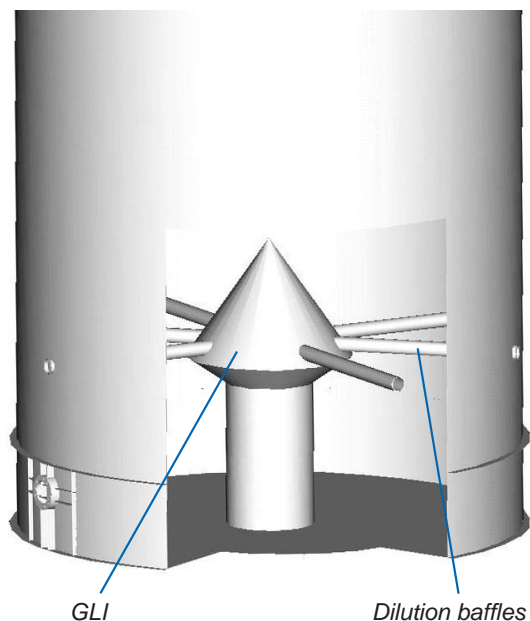
A mill had problems with the air content of pulp in its storage tower. Before installation of the TES, the air content was fluctuating badly and averaging 6 % (blue curve in the figure). After installation of the TES, the air content decreased to 2 % and the variation was markedly reduced, as shown by the red curve.

## SALOMIX® GLI

GLI is a special center fillet located at the bottom of the storage tower. GLI enables trouble-free operation of medium and high consistency storage and bleaching towers with a large bottom zone using several agitators.

### Benefits:

- GLI with dilution baffles is used to create a well controlled mixing/dilution zone at the bottom of the tower.
- GLI effectively separates the tower's storage zone from the active mixing and dilution zone, thus providing a powerful tool for ensuring an even discharge consistency and good operation of the tower.
- More than 100 MC and HC storage towers around the world are operating with the help of GLI.



## SALOMIX® VULCA

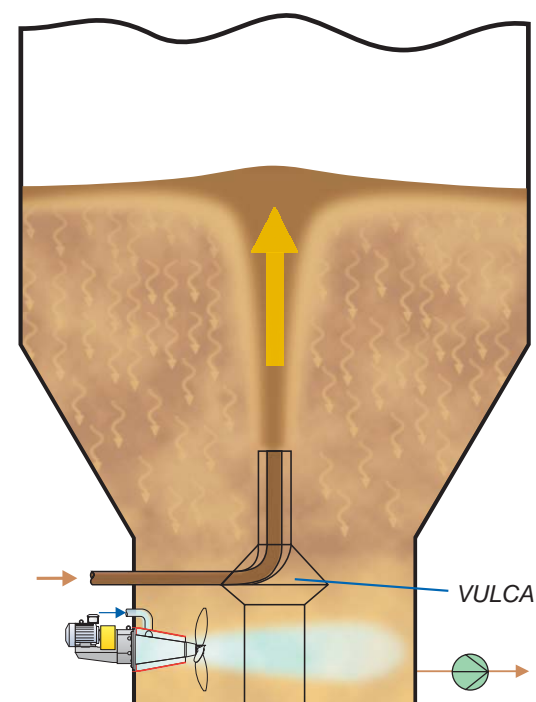
VULCA is another type of center fillet pillar that is also located at the tower bottom. The filling and pumping of stock is carried out through VULCA.

### Benefits:

- Saves pumping energy.
- Boosts bottom zone mixing.
- Prevents the mixing of air into the stock at low stock levels.

### Customer case: VULCA increases pulp production and reduces air

Feedback from a mill indicates that by using VULCA in one line only, significant savings were achieved. For example, the discharge time of the digesters has been reduced from 35-40 minutes to 25 minutes, while digester production has increased 4%. At the same time, the amount of dilution liquor was reduced from 100 m<sup>3</sup> to 50 m<sup>3</sup> for each blow, agitation power reduced from 330 kW to 165 kW, and the air content was lowered from 10-15% to 5-8%.



## MC<sup>®</sup> Discharge Scraper

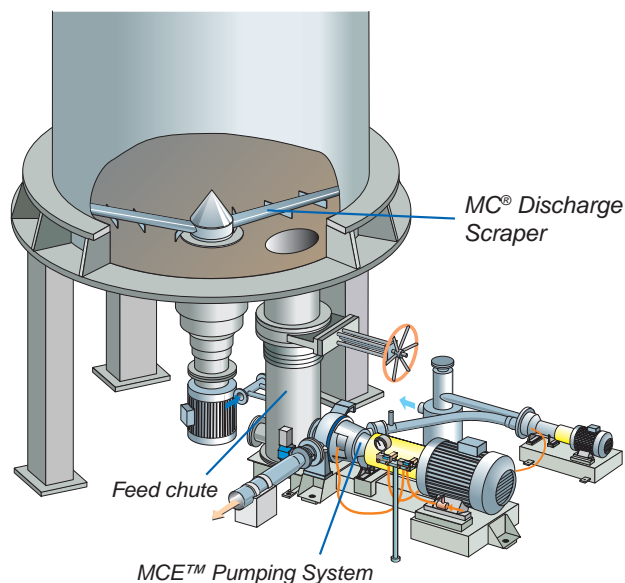
MC<sup>®</sup> Discharge Scrapers are designed for transferring stock from storage or bleaching towers to the feed chute of the MCE<sup>™</sup> pumping system.

### Capabilities:

- to 13 % tower consistency without dilution
- to 20 – 35 % tower consistency with dilution
- the pumping consistency from the tower is typically 8 – 13 %

### Benefits:

- Discharge, dilution and feed to pump with one device.
- The scraper scrapes the stock over the complete bottom area of the tower, thus enabling an even discharge and preventing channelling of the stock in the tower.
- The discharge scraper also stabilizes the pumping procedure.

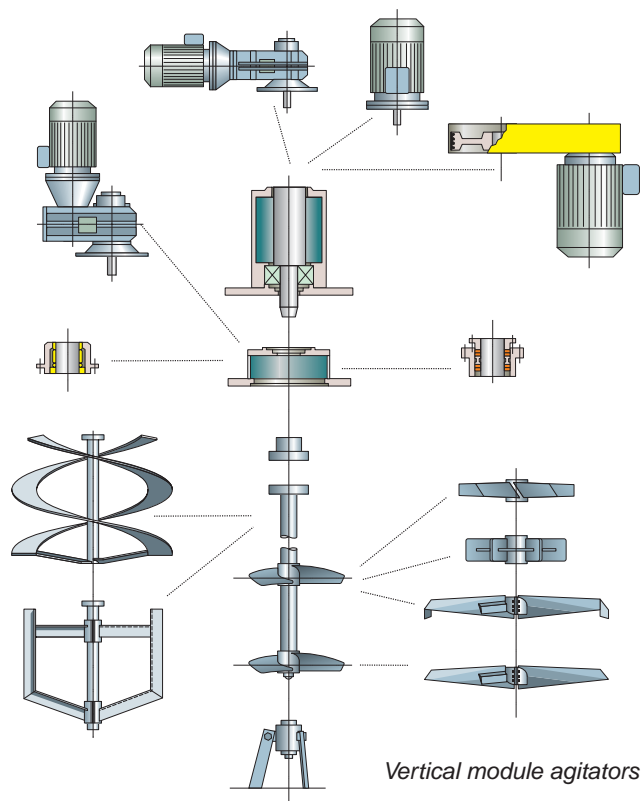


## SALOMIX<sup>®</sup> L Series Vertical Agitators

The L series covers gear or belt driven agitators mounted vertically on the tank top or bottom flange. L series agitators are intended for storage towers, dissolvers, reactors, and production vessels.

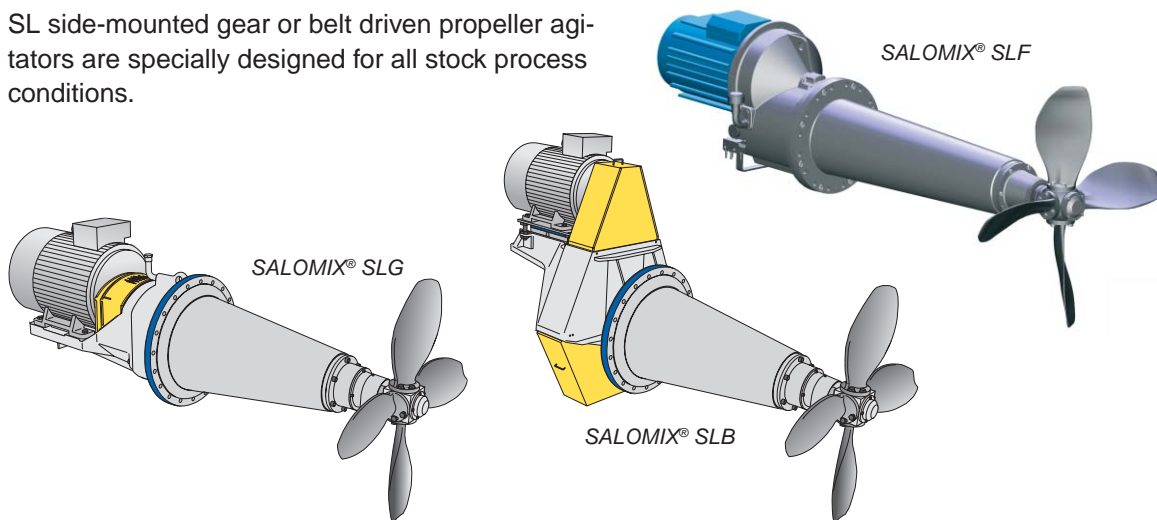
### Benefits:

- Versatile impeller options meet any process needs in compliance with the rheology of the mixed fluid.
- Maximum modular component flexibility.
- Applicable for tanks from 1 to 2,500 m<sup>3</sup>.
- Impeller diameters up to 8,300 mm and power range up to 450 kW.



# SALOMIX® SL Series Horizontal Agitators

SL side-mounted gear or belt driven propeller agitators are specially designed for all stock process conditions.

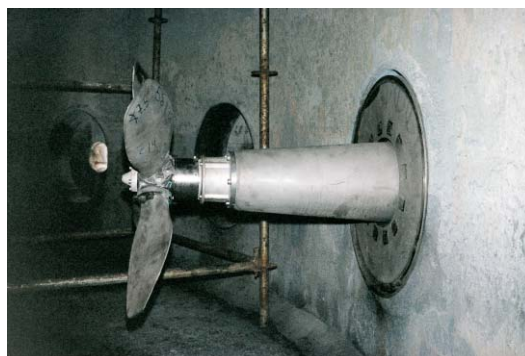


## Benefits:

- High efficiency results in energy savings and improved agitation.
- Cast, four-bladed, adjustable propeller gives accurate power control.
- Stiff conical body allows longer shaft than in conventional construction.
- Stiff conical body minimizes bending force of the shaft.
- Longer shaft enables enhanced agitation efficiency.
- Applicable for all kind of tanks and towers in pulp and paper processes.
- Maximum agitated consistency 6 %, power 110 kW and propeller diameter 1,700 mm.

## Customer case: SALOMIX® SL horizontal agitator saves energy

A mill had three conventional cantilever type side entry agitators in the tank, each with an installed motor power of 30 kW. The agitators experienced numerous mechanical problems. All three agitators were replaced with a single SALOMIX® SLB agitator with a 30 kW motor and the same propeller diameter as the original agitators (photos).





## Sulzer Environmental Concept

Environmental considerations have always been of importance to Sulzer Pumps in the design of the company's pumping and mixing solutions. These same considerations are an integral feature of the tower management process equipment, which are designed to be effective throughout the entire life cycle.

All our factories work in accordance with the quality management system and environmental management system. EN ISO 14001:1996 certification was awarded to the foundry as early as 1998, followed by an environmental award in 2002.

All relevant directives and standards pertaining to legislation and product safety are strictly adhered to.



**SULZER**

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