Alfa Laval ALT

Agitators

Introduction
The Alfa Laval ALT is a top-mounted agitator with free-hanging shaft for hygienic mixing and blending in atmospheric and pressurized tanks. Its versatile, modular and hygienic design enables customization to meet the requirements of virtually any duty and ensures cost-effective, energy-efficient operation. Exceptional cleanability through Cleaning-in-Place makes the ALT agitator ideal for use in sterile and aseptic applications. An ATEX-certified version is available for use in potentially explosive environments.

Applications
The ALT top-mounted agitator is designed for a wide range of tank mixing and blending duties across the dairy, food, beverage, personal care, biotechnology and pharmaceutical industries.

<table>
<thead>
<tr>
<th>Duties</th>
<th>Typical examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keeping media homogenous</td>
<td>Milk storage tanks, cream tanks, mixed products tanks, UHT, and products storage tanks</td>
</tr>
<tr>
<td>Mixing and solutions</td>
<td>Fluid and fluid mixing, drinking yoghurt and fruit mix tanks, flavoured milk mix tanks, and syrup mix tanks</td>
</tr>
<tr>
<td>Dispersing</td>
<td>Powder protein and oil mix tanks, micro salt and milk product mix tanks</td>
</tr>
<tr>
<td>Suspension</td>
<td>Fluids with particles, juice tanks, crystallizing tanks, etc.</td>
</tr>
<tr>
<td>Heat transmission</td>
<td>Circulation of media in tank with dimple jacket (cooling or heating)</td>
</tr>
<tr>
<td>Flocculation</td>
<td>Wastewater treatment tanks</td>
</tr>
</tbody>
</table>

Benefits
• Versatile, modular, hygienic design
• Can be configured for minimum energy consumption
• Gentle product treatment
• More uptime and higher yields due to low maintenance requirements
• Meets EU and US standards and regulations such as EHEDG, USDA, FDA and 3-A Sanitary Standards

Standard design
The Alfa Laval ALT top-mounted agitator consists of a drive unit with optional bearing frame, free-hanging shaft with special shaft seal, and one or multiple specially designed energy-saving impellers (EnSaFoil) with two or three blades. The Alfa Laval agitator range includes top-, bottom- and side-mounting models.

Working principle
The Alfa Laval ALT top-mounted agitator has an electrical drive motor that transmits the energy required for mixing and blending, either directly or via a gearbox, to the agitator shaft. The shaft rotates, turning the EnSaFoil impellers. The impeller movement creates a high flow with low shear due to the highly effective axial pumping effect on the liquid in the tank. This results in effective mixing and blending of the entire contents of the tank.

Options
• Welding flange
• Low level impeller
• Stainless steel cover for motor/gear motor
• Spare part kit
• ATEX version

Certification
Alfa Laval Q-doc and ATEX certifications available, depending on the individual configuration.
TECHNICAL DATA

Motor
Motor size and speed as required for duty.
As standard with IEC motor IP55, other types on request. As standard painted RAL5010

Voltage and frequency
As standard for 3x380 to 420V, 50Hz - 3x440V to 480V, 60Hz. All motor voltages and frequencies are available

Gears
Different gear types available according to configuration
As standard filled with food approved oil. As standard painted RAL5010

Product wetted surface finish
Industrial, shot peened: Ra < 3.2 μm
Hygienic, polished: Ra < 0.8 μm
Hygienic (UltraPure), polished or electro polished: Ra < 0.51 μm

ATEX - option
Agitators can be delivered approved for use in an ATEX environment with declaration of conformity

PHYSICAL DATA

Materials
Steel parts: AISI 316L (standard)
Other materials on request
Seal rubber parts (O-rings or bellows):
EPDM
FPM
FPM/FEP (only for stationary O-rings)
Other materials on request.
Mechanical seal parts:
Carbon
Carbon (FDA)
Silicon carbide

Material certificate - option
3.1 Material certificates/FDA conformity statement according to 21 CFR177 on steel/elastomer parts in contact with the media

Dimensions
Standard propeller diameter range: Ø125 mm to Ø1900 mm
Specific dimensions on the drive unit and propeller(s) will depend on the actual configuration selected

Advantageous and profitable design
Each configuration offers a number of advantages, which are shown in the examples below:

<table>
<thead>
<tr>
<th>Operation features</th>
<th>Due to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low energy consumption:</td>
<td>the wide range of high efficiency propellers and drive units makes it possible to design for low operational costs</td>
</tr>
<tr>
<td>Gentle product treatment:</td>
<td>the wide range of high efficiency propellers makes it possible to design for low shear operation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hygienic features</th>
<th>Due to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy external cleaning:</td>
<td>stainless steel bearing frame design with seal O-rings (for wash down)</td>
</tr>
<tr>
<td>Connections inside the tank (risk zones) can be avoided:</td>
<td>bearing frame drives with drive shaft and special internal shaft connection without having a flange coupling inside the tank</td>
</tr>
<tr>
<td>Good drip off properties:</td>
<td>no plane surfaces or grooves on internal parts</td>
</tr>
<tr>
<td>Easy cleaning:</td>
<td>no interior shadow sides between the blades and smooth surfaces</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maintenance features</th>
<th>Due to</th>
</tr>
</thead>
<tbody>
<tr>
<td>All service (replacement of wearing parts such as shaft seals, bearings etc.) can be done from outside the tank:</td>
<td>bearing frame drives with detachable shaft which can be dismounted from outside the tank</td>
</tr>
<tr>
<td>Easy dismantling:</td>
<td>use of spider type coupling and stainless steel parts (no corrosion)</td>
</tr>
</tbody>
</table>

Configurable design
Type ALT agitator design is fully configurable divided in the following elements:
Each element has a broad range of different characteristics which make it possible to size the agitator for all applications and requirements.
Top mounted agitators

**Type ALT**

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Description</th>
<th>Number</th>
<th>Diameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-ME-GR-Bxx(yy)</td>
<td>Stainless steel bearing frame and right angle gearbox (for low head room applications)</td>
<td>n</td>
<td>vvv</td>
<td>-nPvvvD3P 3 - bladed propeller, finish: polished Standard: Ra &lt; 0.8 μm</td>
</tr>
<tr>
<td>-ME-GC-Bxx(yy)</td>
<td>Stainless steel bearing frame and coaxial gearbox</td>
<td>n</td>
<td>vvv</td>
<td>-nPvvvD3PE 3 - bladed propeller, finish: polished and electro polished Standard: Ra &lt; 0.8 μm</td>
</tr>
<tr>
<td>-ME-Bxx(yy)</td>
<td>Stainless steel bearing frame and direct motor drive</td>
<td>n</td>
<td>vvv</td>
<td>-nPvvvD3G 3 - bladed propeller, finish: shot peened</td>
</tr>
<tr>
<td>-ME-yy</td>
<td>Direct motor drive, shaft connected directly to motor</td>
<td>n</td>
<td>vvv</td>
<td>-nPvvvD2P 2 - bladed propeller, finish: polished Standard: Ra &lt; 0.8 μm</td>
</tr>
<tr>
<td>-ME-yy -ME-</td>
<td>Right angle (GR) or worm (GW) gear drive, shaft mounted in hollow shaft of gearbox</td>
<td>n</td>
<td>vvv</td>
<td>-nPvvvD2PE 2 - bladed propeller, finish: polished and electro polished Standard: Ra &lt; 0.8 μm</td>
</tr>
<tr>
<td>-ME-GP-yy</td>
<td>Parallel shaft gearbox, shaft mounted in hollow shaft of gearbox</td>
<td>n</td>
<td>vvv</td>
<td>-nPvvvD2G 2 - bladed propeller, finish: glass shot peened</td>
</tr>
</tbody>
</table>

**Seal arrangements**

- **F-R-** Seal flange with O-ring seal against tank flange, drain, oil trap and shaft seal: radial seal for atmospheric tanks
- **LF-R-** Lantern (spacer), seal flange with O-ring seal against tank flange, drain, oil trap and shaft seal: radial seal for atmospheric tanks
- **LF-S-** Lantern (spacer), seal flange with O-ring seal against tank flange, drain, oil trap and shaft seal: single mechanical dry running seal for high/low pressure applications
- **LF-D-** Lantern (spacer), seal flange with O-ring seal against tank flange, drain, oil trap and shaft seal: double mechanical seal for high pressure applications and aseptic use

**Shaft**

Length = llll

- **Sllll-** SS shaft, length according to application

**Energy Saving Foils**

Number = n

Diameter = vvv (125 mm to 1900 mm)

- **nPvvvD3P** 3 - bladed propeller, finish: polished Standard: Ra < 0.8 μm
- **nPvvvD3PE** 3 - bladed propeller, finish: polished and electro polished Standard: Ra < 0.8 μm
- **nPvvvD3G** 3 - bladed propeller, finish: shot peened
- **nPvvvD2P** 2 - bladed propeller, finish: polished Standard: Ra < 0.8 μm
- **nPvvvD2PE** 2 - bladed propeller, finish: polished and electro polished Standard: Ra < 0.8 μm
- **nPvvvD2G** 2 - bladed propeller, finish: glass shot peened

**Ordering**

The following information is required to ensure correct sizing and configuration for ordering:

- Tank geometry
- Product properties
- Task of agitator
- Enquiry forms are available