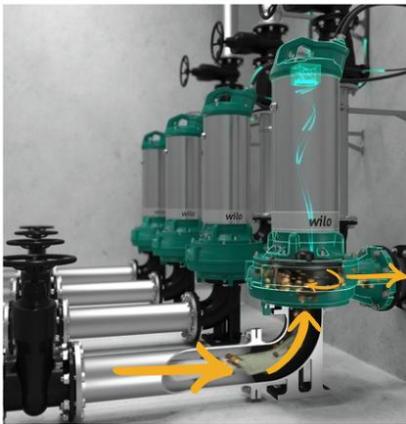


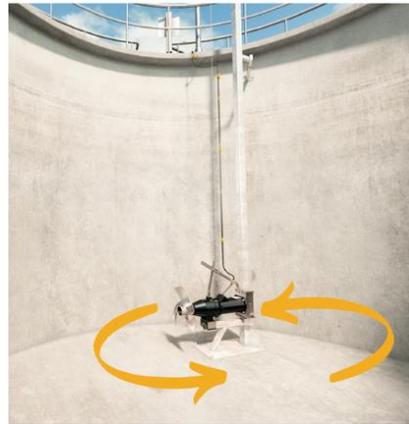
Mixers versus Pumps

Different tools, different purposes

Mixers and pumps are often found in the same facilities, but they serve very different functions. Pumps are designed to move liquid from one place to another by generating pressure. **Mixers**, on the other hand, keep liquid and solids in motion within the same tank or basin by generating circulation and thrust.



Pump: Provides pressure to move fluid from one location to the next



Mixer: Pushes water to create flow and circulation

The Pump



A **pump** is a mechanical device designed to move liquids from one location to another by imparting energy to the fluid. This energy typically comes in the form of **pressure (head)** and/or flow rate, allowing the liquid to overcome friction losses, elevation changes, and system resistance. Most pumps use a rotating impeller (**rotodynamic pump**) or piston (**positive displacement pump**) to increase the liquid's velocity and pressure, allowing it to flow through pipes or systems.

In a **centrifugal pump**, for example:

- Liquid enters the pump through the suction inlet.
- The impeller spins, imparting kinetic energy to the fluid.

- The spinning motion pushes the liquid outward into the pump casing, converting kinetic energy (velocity) into potential energy (pressure).

The pressurized liquid exits through the discharge outlet to flow through the piping system. The pump's performance is measured by flow (gallons per minute) and head (feet), or pressure generated and depends on factors like impeller size, speed, system resistance, and fluid properties. By controlling these variables, pumps can deliver liquids efficiently to meet flow and pressure requirements.

Pumps are used in a wide range of applications, including water distribution, wastewater transfer, chemical processing, and industrial systems. Within the water management segment, pumps are intended to transport fluid through piping or between separate tanks, delivering it efficiently to the desired destination. Proper pump selection requires considering the fluid properties, system layout, required flow, and pressure needs to ensure reliable and energy-efficient operation.

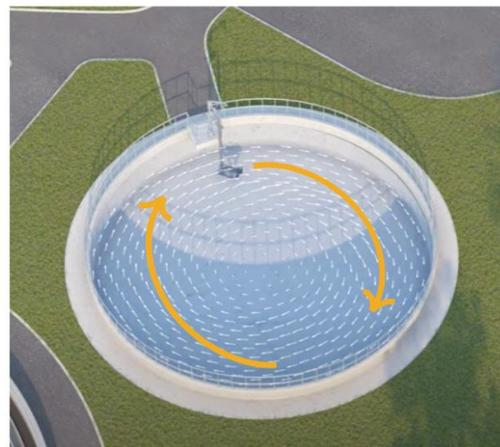
The Mixer



A mixer is a mechanical device designed to keep liquids and solids in motion within a single tank or basin. Its primary function is to create circulation and maintain uniform suspension, preventing sedimentation and ensuring that solids, liquids, and any added chemicals are evenly distributed.

Mixers generate **thrust** (N) and flow rather than pressure, using a propeller or axial-flow impeller to push fluid in an axial or radial direction. This continuous circulation supports biological, chemical, and physical processes, such as aeration, sludge treatment, and homogenization in municipal and industrial applications.

Unlike pumps, mixers do not transfer liquid from one location to another; instead, they maintain flow within the tank, keeping the mixture consistent and preventing stratification or settling of solids. Performance is measured by thrust, which reflects the ability of the mixer to move and suspend the liquid and solids effectively.



How Mixers Differ from Pumps

Mixers differ from pumps in both purpose and function. While pumps are designed to move liquid from one location to another by generating pressure, mixers keep liquids and solids circulating within the same tank or basin. Mixers create thrust and flow to maintain suspension and ensure uniform mixing, rather than building pressure to push liquid through pipes. Because of these differences, mixers are tested using [ISO 21630](#), which measures thrust and circulation, while pumps follow [Hydraulic Institute \(HI\)](#) standards, which measure head, flow, and efficiency. In short, pumps transfer liquid, while mixers keep it moving.

**Pumps transfer liquids
Mixers keep it moving**

Difference Between Mixers and Pumps

Feature	Mixer	Pump
Primary Function	Creates flow and circulation within the same tank or basin.	Moves liquid from one location to the next.
Output	Produces flow and thrust (circulation, suspension).	Produces flow and pressure (head).
Performance Measure	Measured by thrust (N) per ISO 21630	Measure by head (ft or m) and flow rate (gpm or m ³ /h).
Design Focus	Propeller design and speed to optimize mixing efficiency.	Hydraulic casing/volute design to build pressure and deliver volume.
Application	Keeps solids in suspension, blends liquids, aids biological processes.	Transfers liquids through piping systems to a desired destination.
Flow Pattern	Recirculates liquids within the same body, non-pressurized.	Moves liquid directionally with pressurized discharge.
Energy Use	Energy goes into circulation and suspension (low pressure, high volume).	Energy goes into overcoming static head and friction losses.
Installation	Typically submerged inside tanks or basins.	Typically installed with piping system.
End Goal	Uniform mixture, prevent sedimentation, enhance process efficiency.	Deliver fluid efficiently from point A to point B.

In summary, pumps and mixers are complementary but not interchangeable. Pumps are essential for transporting liquids through systems by generating flow and pressure, while mixers are vital for keeping liquids and solids in motion within a tank to ensure proper suspension and mixing. Understanding these differences—and the standards that define them—helps ensure the right equipment is selected for the right task, leading to more efficient and reliable system performance.

Wilo is Your Solutions Provider

Wilo USA headquartered in Cedarburg, WI, is a multi-national pump manufacturer and one of the world's leading premium suppliers of pumps and pumps systems for **building services**, **water management**, and the **industrial sector**. With innovative solutions, smart products, and individual services, Wilo is your solution provider in making water move using intelligent, efficient, and eco-friendly techniques

Wilo manufactures a wide range of **centrifugal pumps** and **submersible mixers**, including the Wilo-Flumen OPTI-TR and -Flumen EXCEL-TRE product lines and the **Wilo-EMU TR(E) 216-326** line. For more information regarding Wilo's submersible mixers, how to size them, and other sustainable solutions, visit the **Wilo USA website** or take a quick look through the **Wilo Product Guide** for more options.

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