

Impellers | HWM Series

Professional Mixing Technologies

Next Generation Efficiency in Mechanical Mixing Technologies

Mechanimix provides innovative solutions that combine high efficiency, reliability, and process optimization in industrial mixing technologies. The HWM series wide-blade impellers are specially designed for multiphase mixtures, polymerization, crystallization, and suspension processes, delivering low shear force and superior flow control. This design ensures homogeneous energy distribution and minimal turbulence, resulting in consistent and reliable performance at both laboratory and industrial scales.

INDUSTRIES

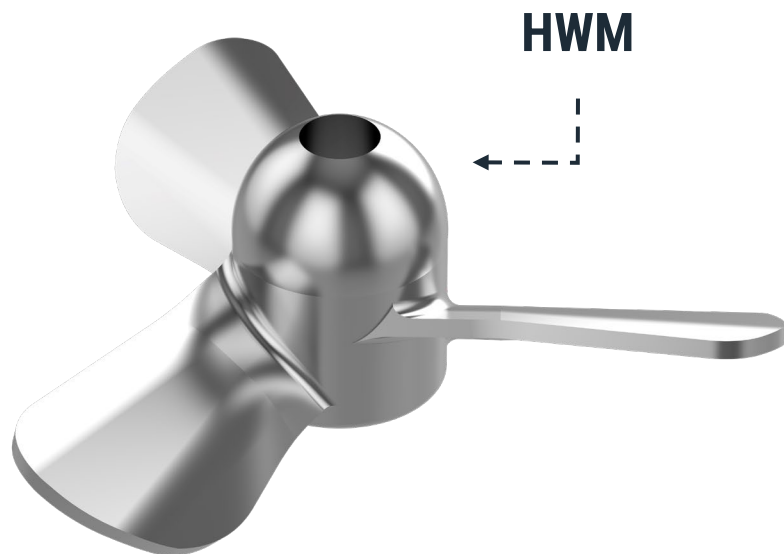
- Chemical
- Polymer
- Active Pharmaceutical Ingredient (API)
- Specialty Consumer Products
- Hydrometallurgy

APPLICATIONS

- Mixing and storage tanks
- Polymerization
- Crystallization and precipitation
- Multi-purpose mixing
- Suspension

ADVANTAGES

- Low shear force
- Reliable chemical reactions
- Efficient heat transfer
- Short mixing times
- Reliable suspension (including gas-liquid systems)



FEATURES

- Axial flow with wide-blade impeller
- Suitable for low and medium viscosity systems
- Homogeneous energy distribution
- Minimum local turbulence



Material Variants and Application Range

Professional Mixing Technologies



HWM
(Stainless Steel)

Material

- High-grade stainless steel

Features

- Excellent corrosion and chemical resistance
- Hygienic design with polished / electropolished surface
- Easy to clean and resistant to microbial contamination

Typical Applications

- Chemical, pharmaceutical, and food industries
- Active Pharmaceutical Ingredient (API) production
- Processes involving mild to aggressive chemicals

Advantages

- Reliable operation
- long service life
- High surface quality



HWM
(Rubber Lining)

Material

- Carbon-steel impeller body with rubber lining

Features

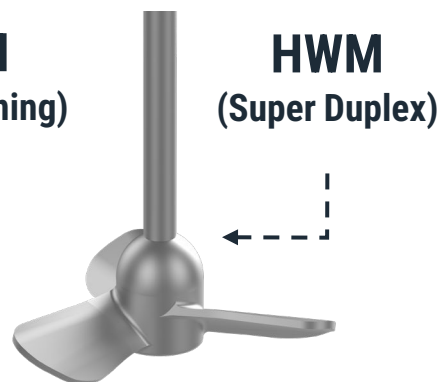
- Superior durability in abrasive and corrosive environments
- Excellent chemical and mechanical wear resistance
- Rubber surface absorbs impact from solid particles

Typical Applications

- Mining and hydrometallurgy
- Slurry and solid-liquid mixing
- Acidic or particle-rich process environments

Advantages

- Prevents metal-liquid contact
- Extends equipment lifespan
- Enhances process safety



HWM
(Super Duplex)

Material

- Super Duplex Stainless Steel

Features

- Very high mechanical strength
- Outstanding resistance to pitting and stress-corrosion cracking
- Stable performance in chloride- and acid-rich environments

Typical Applications

- Offshore and marine systems
- High-pressure / high-temperature chemical processes
- Aggressive corrosive or oxidizing media

Advantages

- Superior corrosion resistance
- Long-lasting performance under extreme conditions
- Ensures safe and stable operation



Flow Behavior and CFD Analysis

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Advanced Flow Dynamics and CFD Optimization

For products with non-Newtonian flow behavior, the Mechanimix HWM impeller is a versatile mixing solution capable of operating across a wide range of viscosities. This impeller type can be adapted to different process requirements by using versions with various blade angles and numbers. The design of the blade arm and hub connection facilitates easy cleaning and maintenance.

CFD Results and Flow Characteristics

The Mechanimix HWM impeller is an optimized and versatile mixing solution for both Newtonian and non-Newtonian fluids. As shown in CFD analyses, the wide-blade geometry effectively directs the flow down to the tank bottom. This design maximizes axial thrust and ensures uniform energy distribution, resulting in homogeneous mixing.

The flow paths and velocity distribution eliminate dead zones within the system, providing highly efficient mixing performance. With different blade angles and blade numbers, its modular design can be customized for various process requirements. The hygienic design of the blade and hub connection also simplifies cleaning and maintenance.

1. Flow Distribution

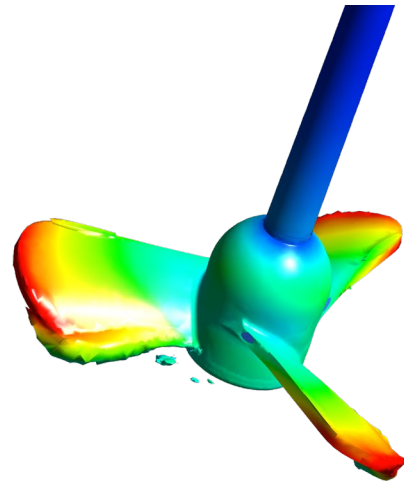
The HWM impeller directs the flow axially, ensuring homogeneous mixing and eliminating dead zones within the tank.

2. Side View

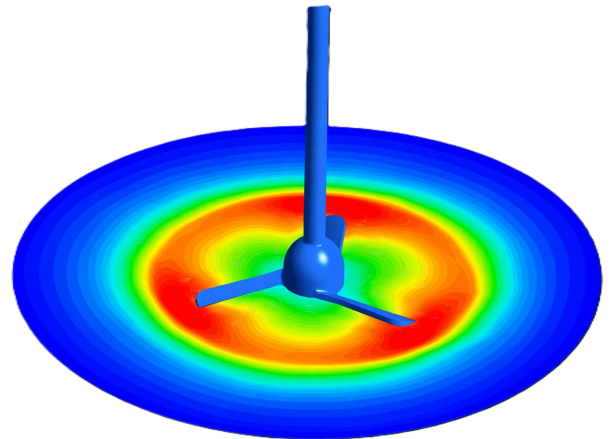
The flow reaches all the way to the tank bottom. Its low shear rate makes it ideal for sensitive reactions and multiphase systems.

3. Top View

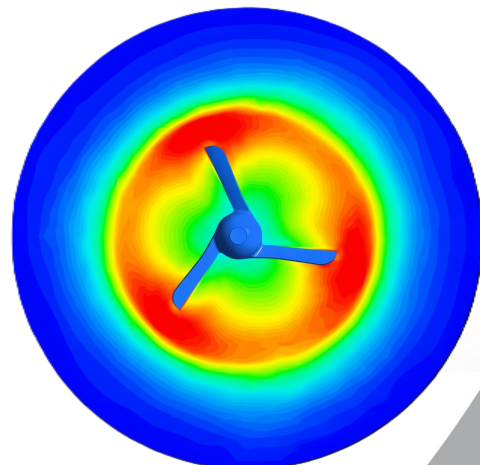
The flow spreads symmetrically from the tank center toward the walls. It provides maximum efficiency with minimum turbulence.



Flow Distribution



Side View



Top View