



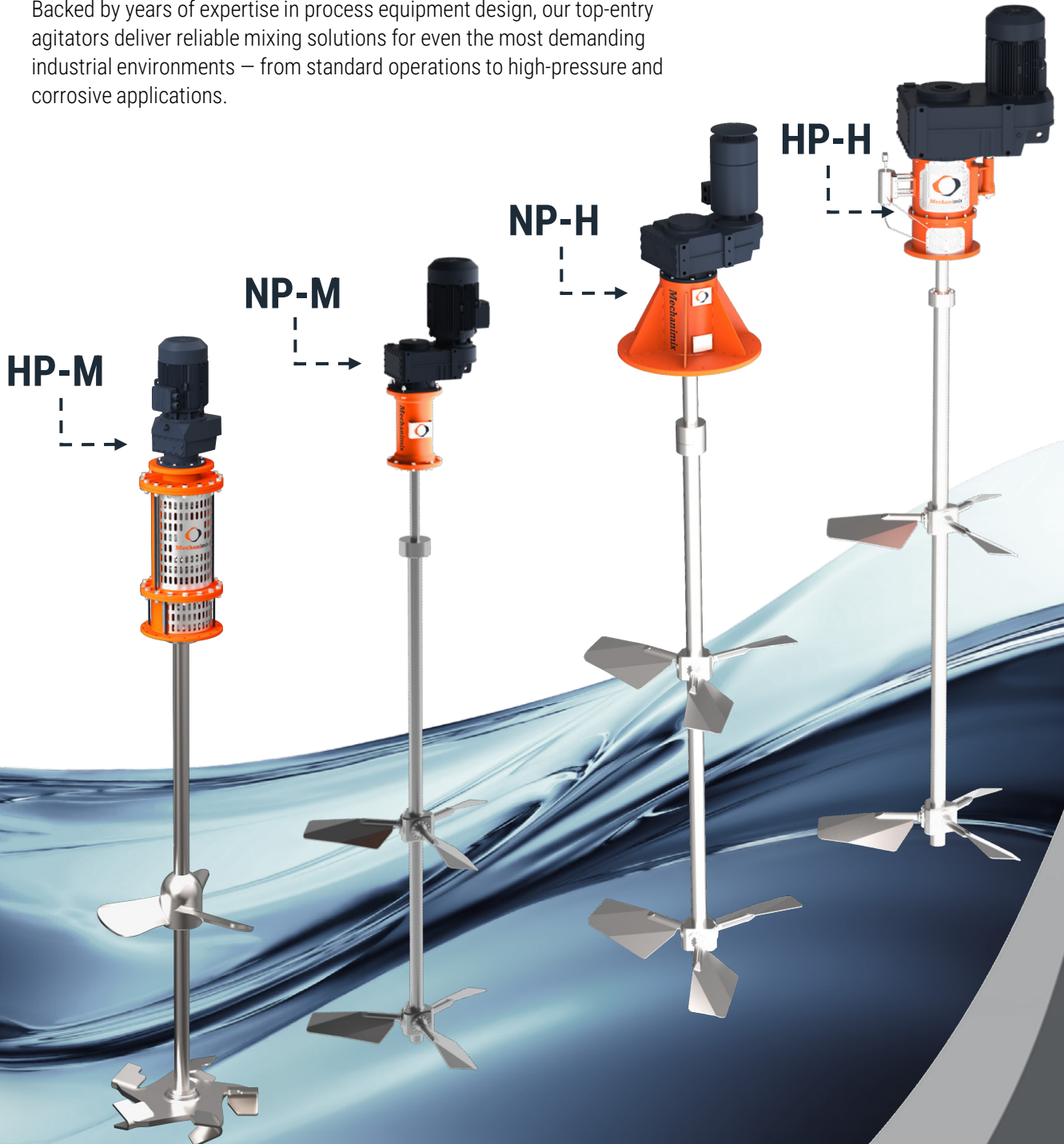
Mechanimix

Top Entry Agitators

Professional Mixing Technologies

Advanced Engineering, Superior Performance

Backed by years of expertise in process equipment design, our top-entry agitators deliver reliable mixing solutions for even the most demanding industrial environments – from standard operations to high-pressure and corrosive applications.



General Properties

Professional Mixing Technologies

Top-entry agitators stand out with their modular design, suitable for heavy-duty operating conditions. They can be customized according to standard or special process requirements and equipped with different drive units, shaft types and lengths, as well as various sealing systems

Features

- Power up to 132 kW
- Shaft diameter 20-220 mm
- Shaft length up to 15 m in 3 stages
- Operating Pressure up to 100 bar

Material Technology

Construction Materials

SS316, SS316L, Nickel Base Alloy, Titanium Alloy, Carbon Steel, Aluminum, Cast Iron

Mechanimix has extensive experience supplying advanced materials for harsh industrial applications.

Examples of stainless-steel materials we supply:

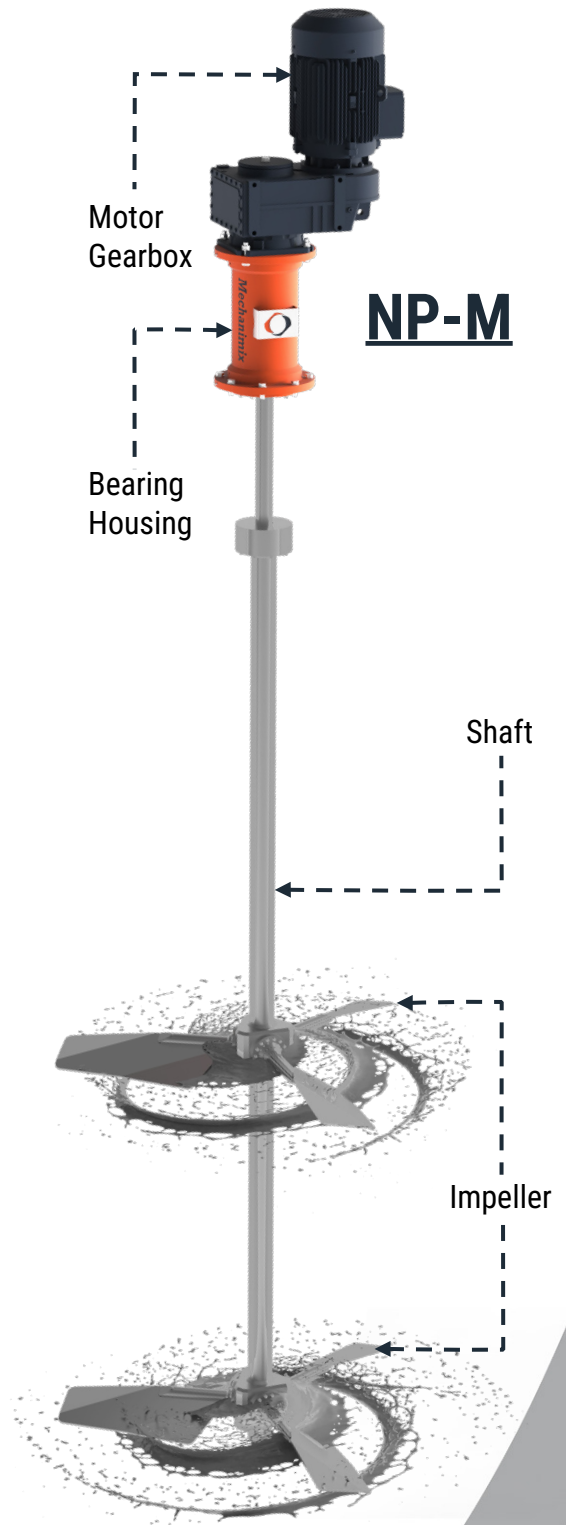
- Austenitic stainless steel
- Duplex stainless steel
- Super duplex
- SMO

Agitator Coatings:

- Tailored coatings for small-to-large agitators in aggressive environments
- Rubber, polyethylene, or ceramic coatings for mineral processing and similar industries
- Agitator coatings matched to tank surfaces to prevent wear or chemical reaction
- Seals and clearances designed to protect coating integrity under stress



Coated Impellers

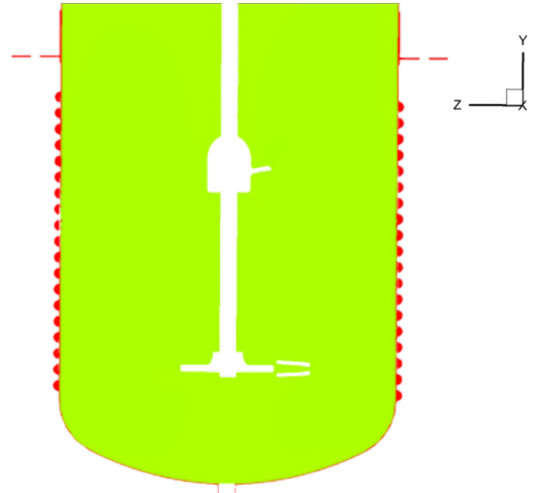


Flow Simulation at Mechanimix

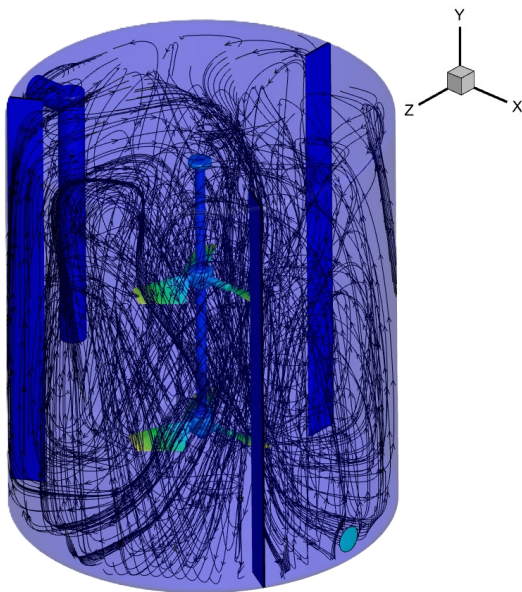
Mechanimix leverages cutting-edge Computational Fluid Dynamics (CFD) technology, alongside laboratory experiments and field trials, to design, scale-up, enhance, or modernize agitators and mixing systems.

Mechanimix engineers utilize CFD technology to gain an in-depth understanding of velocity distribution, flow patterns, areas with low velocity as well as regions with both low and high shear rates within various mixing system configurations.

This enables the testing of multiple system setups and tank agitator designs to achieve optimal performance. Additionally, CFD technology aids Mechanimix in fine-tuning impeller blade designs to strike a balance between power requirements and pumping capacity.



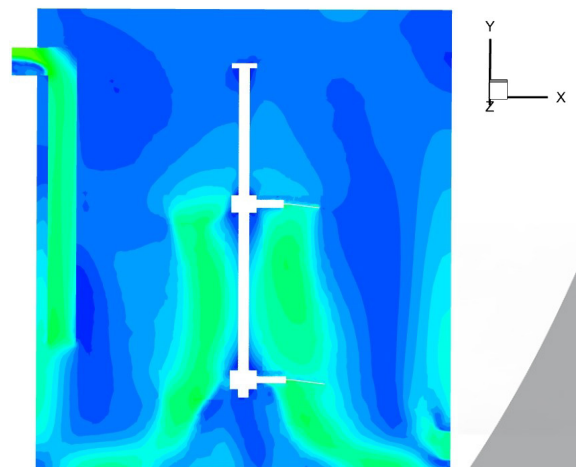
Temperature Distribution



Particle Tracking Visualization

High Efficiency Operation

Mechanimix offers maximum efficiency impellers, optimized through extensive laboratory testing and advanced Computational Fluid Dynamics (CFD) calculations. When it comes to reducing power consumption, choosing the right agitator size is equally important. Using an oversized agitator can get the job done, but it will be very costly. Mechanimix offers the combination of optimum agitator selection and maximum impeller efficiency that will significantly reduce your overall power consumption. When designing new impellers, we conduct numerical simulations as well as experimental studies using CFD.



Velocity Gradient Map

Key Outcomes of CFD-Studies

- In-depth Information on Flow pattern.
- Areas with the potential of low mixing intensity can be pinpointed and rectified.
- Availability of crucial process parameters like shear and energy dissipation.
- Evaluation of different design options.
- Shortened project timelines for complex process mixing systems.
- Mitigation of project risks

Drive Unit

Professional Mixing Technologies

Drive Unit Configuration Options (Fully Customizable According to Process Requirements)

Our agitator drive units are designed with maximum flexibility in mind, allowing full customization based on process needs, environmental constraints, and operational demands.

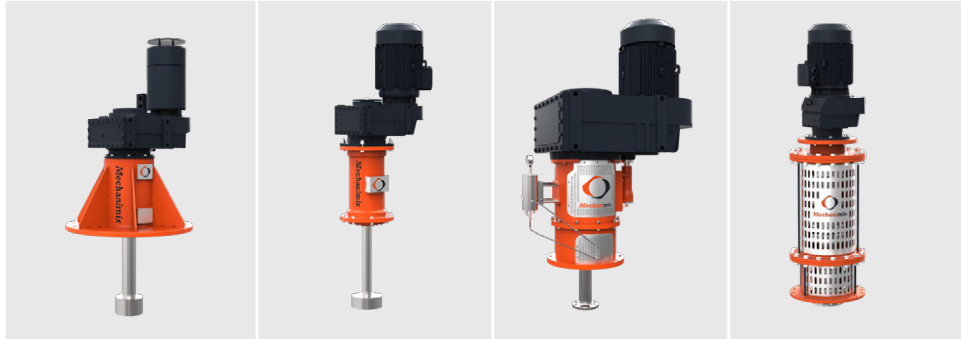
Sealing Options

- **With Mechanical Seal**

For applications requiring closed systems or pressure handling.

- **Without Mechanical Seal**

Suitable for open tank operations or atmospheric conditions.



Type	NP-H	NP-M	HP-H	HP-M
Pressurized	✗	✗	✓	✓
Heavy loads	✓	✗	✓	✗
Mechanical Seal Integration	✗	✗	✓	✓
Approx. Tank Volume	Up to 2000m ³	Up to 100m ³	Up to 2000m ³	Up to 100m ³
industry	– General mixing in open tanks – Mixing of chemical raw materials – Mining and Mineral Processing – Water and Wastewater Treatment – Preliminary production stages of Biofuel – Pulp and Paper Industry		– Food and Beverage – Chemical and Petrochemical – Pharmaceutical and Biotechnology – Energy and Biofuel Production – Pulp and Paper Industry	

Gearbox Types

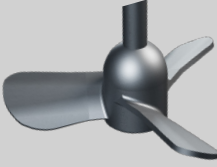
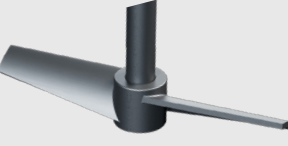




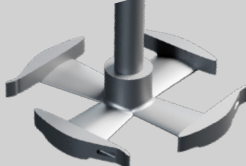
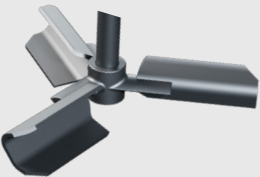
Choose from a wide range of industrial gear units based on torque, mounting, and space limitations:

❖ *All drive units are engineered for reliability, maintainability, and energy efficiency, and can be tailored to suit customer-specific performance requirements or integration with existing systems.*

Helical In-line	Compact design, high efficiency, axial alignment
Helical-Bevel	Angular arrangement, higher torque output, space-saving
Parallel Shaft	Ideal for low-speed, high-torque applications with horizontal layout
Worm Gearbox	Economical, for low-speed and low-torque systems, compact

Advanced Impellers

Professional Mixing Technologies

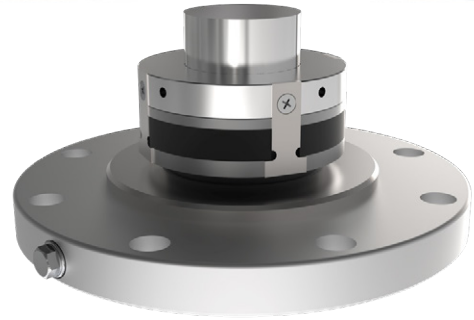
Model	View	Features
HWM		<ul style="list-style-type: none"> – Axial Thrust with Wide Blade Impeller – Application in Low and Medium Viscosity Systems – Homogeneous Energy Distribution – Minimum Local Turbulence
HM		<ul style="list-style-type: none"> – High Flow at Bottom for Solid Suspension – Efficient Mixing in Low/Medium Viscosity – Enhanced Wall Heat Transfer via Axial Flow – Single and Multiple Impeller Arrays – Double, Triple or Quadruple Blade Design – Adjustable Blade Angle
HWM-B		<ul style="list-style-type: none"> – Low, Internal Cutting Force – High Suspension – Homogenizing Function – Working in Gaseous Environments – Supporting Heat Transfer
HVM		<ul style="list-style-type: none"> – For High Viscosity or Critical Rheology Fluids – Upward or Downward Pumping as Needed – Ideal for Blending, Heat Transfer, or Solid Incorporation – Mixes to Ensure No Dead Zones Form
TVM		<ul style="list-style-type: none"> – Application in Low Viscosity Systems or Turbulent Flow Regime – Excellent Axial Thrust Velocities – It Does Not Leave Dead Spots Inside the Tank Inner Wall – Auxiliary impeller enhancing horizontal flow & circulation in tall tanks
GDM		<ul style="list-style-type: none"> – High Suspension Performance Even at High Gas Flow Rates – Radial Thrust Impeller – Main Gas Distributor Role – Works Easily with Gas in Internal and External Power Supply
GM		<ul style="list-style-type: none"> – High Gas Supply Capacity – High Contact Surface Area – Specially Shaped Gas Channels – Homogeneous Energy Distribution – Optimum Suction Power
GDS		<ul style="list-style-type: none"> – Combines Strong Radial and Axial Flows – Excellent Gas Distribution Performance – Fast Mixing – Low Power Consumption – Fully Compatible with Mechanimix GDM

Sealing Options

Professional Mixing Technologies

Sealing Solutions for Top-Entry Agitators

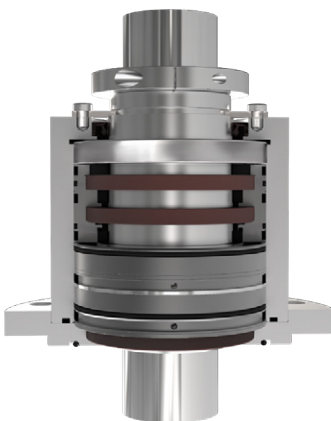
Reliable sealing is essential in top-entry agitators to prevent product leakage, maintain pressure integrity, and ensure long-term performance. We offer a full range of sealing solutions tailored to **process pressure, product characteristics, and operational demands**, ensuring compatibility with any process environment – from atmospheric blending to high-pressure, hazardous, or sterile conditions.



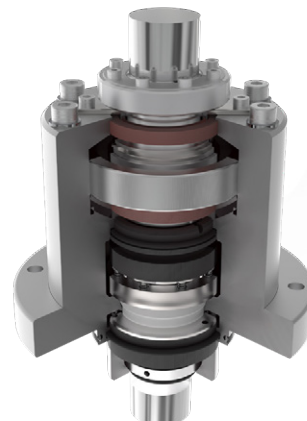
Single-Acting Mechanical Seal

Mechanimix Offered Seals

Seal Type	Application	Features
Rotary Seal	– For non-pressurized, low-viscosity, and non-hazardous media	– Economical and simple – Minimal maintenance
Single Mechanical Seal	– Moderate duty, low to medium pressure	– Compact, cost-effective – Available with dry run protection – Optional quench or lubrication chamber
Double Mechanical Seal	– High-pressure, hazardous, toxic, or sterile media	– Barrier or buffer fluid supported – Ensures zero leakage to atmosphere – Ideal for pharmaceutical, chemical, or solvent-based processes
Dry-Running Seals	– Advanced applications requiring low product contamination	– Contact-free, low wear – Ideal for clean-in-place (CIP) and sterilize-in-place (SIP) operations
Magnetic Drive Sealing	– Maximum containment for ultra-pure or aggressive media	– No mechanical seal required – Zero leakage design – Higher capital cost, but minimal maintenance



Dry-Running Mechanical Seal



Double-Acting Mechanical Seal

Applications

Professional Mixing Technologies

Applications of Top Entry Agitators (Sealed and Non-Sealed)

Mechanimix Top Entry Agitators, renowned for their advanced design and exceptional versatility, serve as optimal solutions for mixing and homogenization processes across various industries. Available in sealed (pressurized) and non-sealed configurations, these agitators are engineered to meet diverse operational requirements with reliable performance.

Chemical and Petrochemical Industries

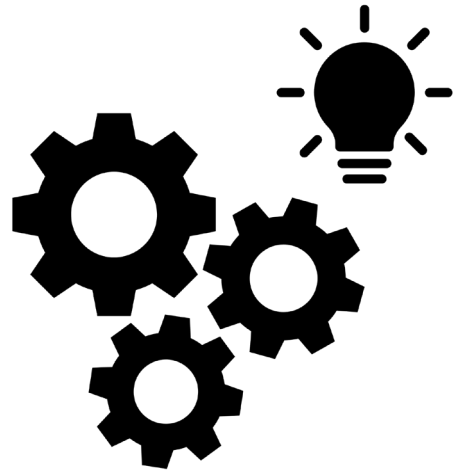
- Application:** Homogenization of chemicals with varying viscosities, production of resins, polymers, and specialized chemical compounds.
- Features:** Sealed models are ideal for sensitive processes requiring isolated environments under high pressure or vacuum, such as catalytic reactions. Non-sealed models are suitable for standard mixing of chemical raw materials.
- Advantage:** Ensures uniform composition and reduces process time in complex chemical production.



Fermentation Tanks

Pharmaceutical and Biotechnology Industries

- Application:** Precise mixing of active pharmaceutical ingredients (APIs), suspensions, and biological solutions in drug and vaccine production.
- Features:** Sealed models ensure sterile conditions and prevent cross-contamination, making them ideal for sensitive pharmaceutical processes.
- Advantage:** Delivers high-precision mixing and compliance with rigorous regulatory standards.



Mining and Mineral Processing

- Application:** Mixing in leaching, flotation, and processing of minerals with abrasive liquids.
- Features:** Robust design ensures reliable performance in harsh conditions with high-density materials.
- Advantage:** Improves extraction efficiency and minimizes equipment wear.

Food and Beverage Industry

- Application:** Emulsification, homogenization, and mixing in the production of dairy products, beverages, sauces, and liquid sugar solutions.
- Features:** Sealed models, compliant with stringent hygiene standards (e.g., GMP), are perfect for sterile and closed processes, while non-sealed models are used for general mixing in open tanks.
- Advantage:** Enhances product quality and streamlines food production processes.



Applications

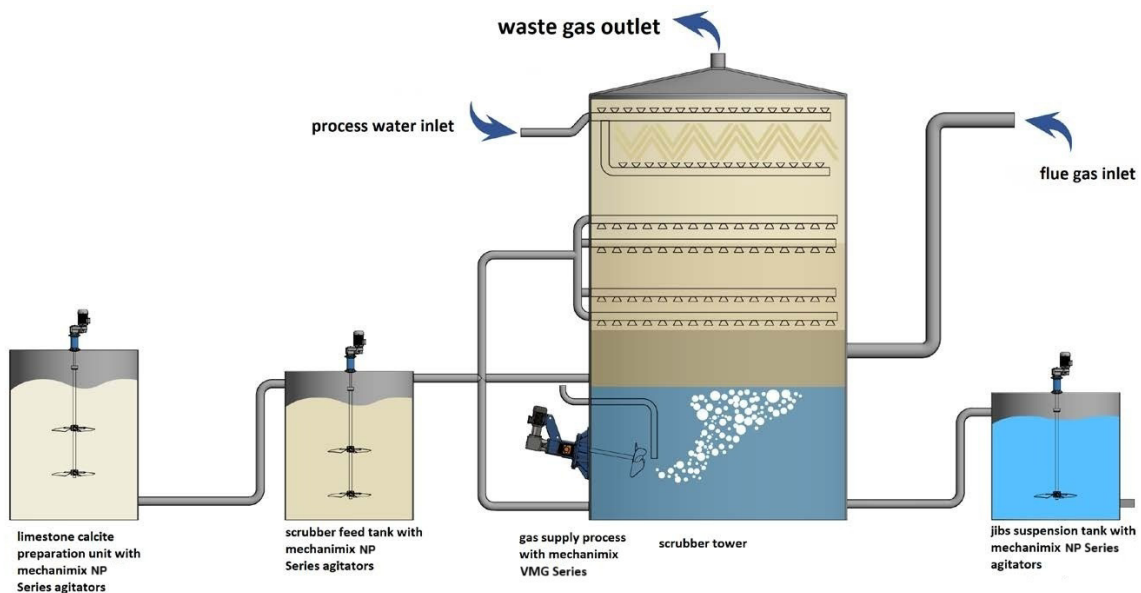
Professional Mixing Technologies

Energy and Biofuel Production

- Application:** Mixing of raw materials and catalysts in the production of bioethanol, biodiesel, and other biofuels.
- Features:** Sealed models are suited for closed processes with specific conditions, while non-sealed models are used for preliminary production stages.
- Advantage:** Optimizes chemical reactions and enhances biofuel production yield.

Pulp and Paper Industry

- Application:** Preparation of fiber suspensions, chemical mixing, and homogenization of pulp in paper production processes.
- Features:** Sealed models support high-temperature and high-pressure processes, while non-sealed models are used for initial mixing stages.
- Advantage:** Enhances pulp quality and increases production yield.



Water and Wastewater Treatment

- Application:** Mixing of chemicals for coagulation, flocculation, neutralization, and aeration in water and wastewater treatment processes.
- Features:** Non-sealed models are suitable for open tanks and general processes, while sealed models are used in closed systems with controlled conditions.
- Advantage:** Improves treatment efficiency and reduces operational costs.

Common Benefits of Top Entry Agitators

Both sealed and non-sealed Top Entry Agitators offer easy installation, low maintenance costs, and customizable designs tailored to various tanks and processes. Their modular and flexible construction makes them an ideal choice for both simple and complex industrial applications, ensuring enhanced efficiency and product quality.

Mixing Technologies

Professional Mixing Technologies

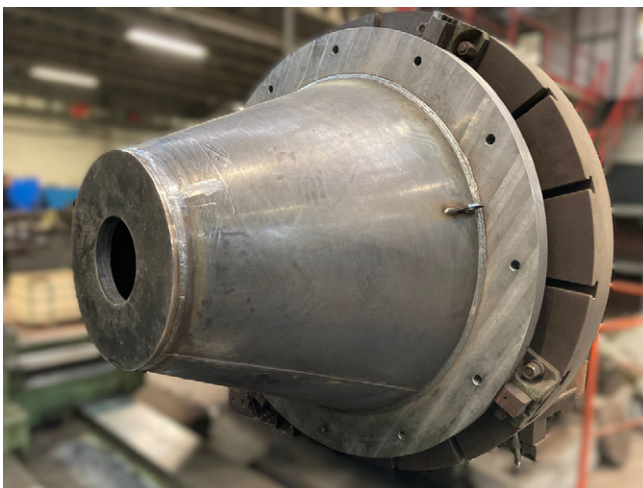
Adjustable Blade Angle

Features	Description
Rotatable Blades	Each blade can rotate around its axis via a bolted shaft connection.
Flow & Intensity Control	Adjusting the angle regulates flow direction, flow rate, and mixing intensity.
Process Optimization	Enables fine-tuning of axial/radial flow ratios without impeller or drive changes.
Efficiency Gains	Shortens cycle time, improves process control, and enhances energy use.
Commissioning Flexibility	Offers maximum adaptability during setup and operational adjustments.
Maintenance-Friendly	Allows easy adjustments without major disassembly.
High-Performance Design	Provides precise process control and robust operation.
Modular Compatibility	Integrates with various drives, impellers and shaft lengths.



Bearing Housing Unit

The HP and NP series agitators feature high-rigidity bearing housings that stabilize operation, ensure seal accuracy, and absorb dynamic loads. Optimized shaft clearance reduces misalignment, vibration, and bearing stress, while accommodating thermal expansion. The result is smoother, quieter, and longer-lasting performance, with multiple seal and housing options for demanding pressure, temperature, and hygiene conditions.



Mixing Technologies

Professional Mixing Technologies

Advanced Condition Monitoring Service for Agitators

Our Approach

- Combining technical expertise with advanced monitoring technologies
- Developed for continuous performance monitoring and early failure detection
- Ensures maximum equipment reliability

How It Works

- Continuous or periodic monitoring of critical parameters
- Detailed data analysis by experts
- Generation of technical reports

Your Benefits

- Early failure prediction
- Optimized maintenance planning
- Extended equipment lifetime
- Improved reliability and efficiency

- ❖ To review all the technical details regarding the service, please take a look at the brochure we have prepared specifically for the [Condition Monitoring Service](#).

Specially Designed Components for Customized Mixing Solutions

What we offer

- Tailor-made selection of impellers, shafts, drive units, and mounting details
- Solutions aligned with both process requirements and mechanical constraints

Why choose us

- Ensured performance, safety, and operational reliability
- Energy-efficient systems that reduce consumption
- Consistent performance across standard and customized solutions

Our promise

- Unmatched engineering expertise
- Delivering systems that maximize efficiency and reliability



Homogeneous stirring

Ex-Proof Design for Hazardous Environments

Certification & Compliance

- Certified Ex-proof (explosion-proof) design by reliable organizations (e.g., HWM)
- Fully compliant with ATEX and IECEx international standards
- Suitable for Zone 1 and Zone 2 classifications

Applications

- High-risk industries such as:
 - Biofuels
 - Chemicals
 - Petrochemicals
 - Solvents
- Designed for environments with explosive gases, vapors, or dust

Key Benefits

- Ensures workplace safety in hazardous environments
- Enables continuous and safe operation under strict industrial conditions
- Can be customized for special projects requiring certified protection

Hygienic Design:

- High surface quality to eliminate dead spots and prevent bacterial growth
- Food-grade oil for gear lubrication
- Special TH flange to prevent external leakage into the tank
- Choice of baffle-less eccentric or hygienic baffled configuration



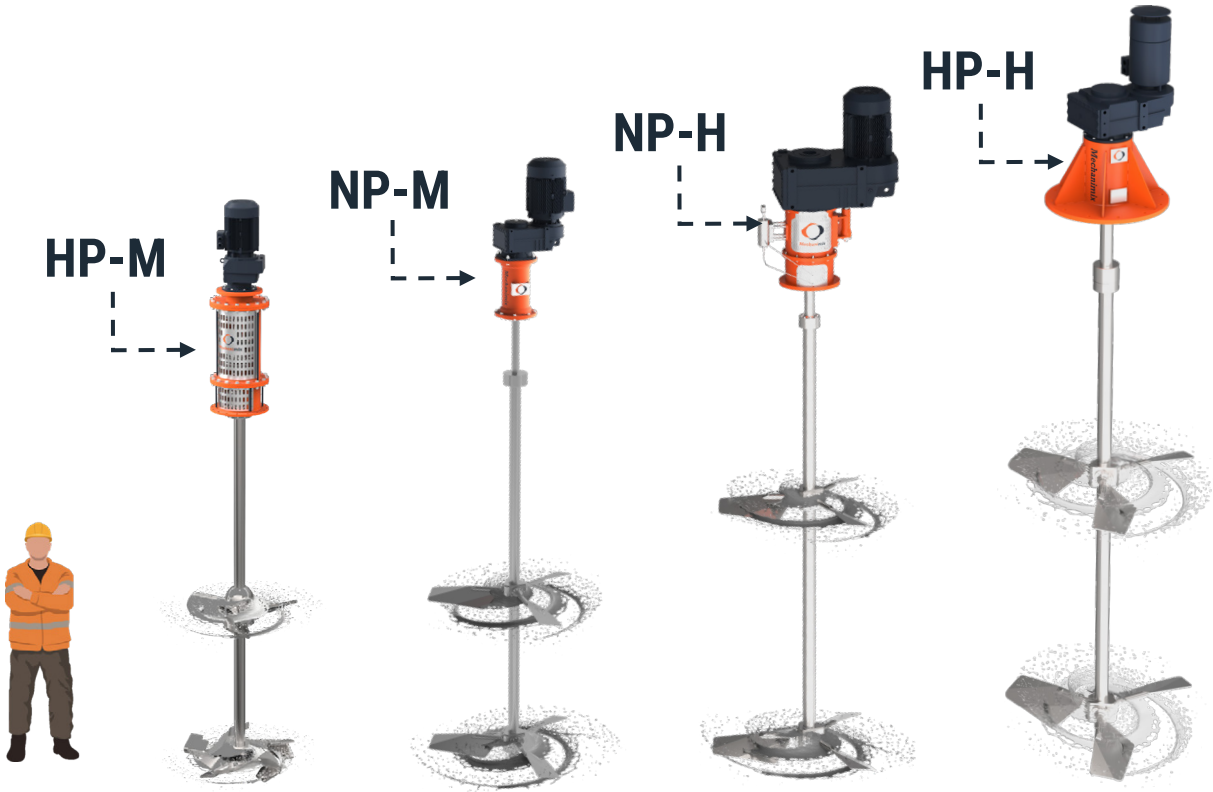
EX PROOF
EXPLOSION-PROOF



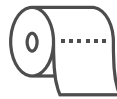
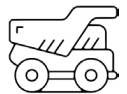
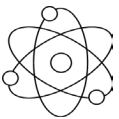
Mechanimix

Top Entry Agitators Dimensions

Professional Mixing Technologies



Suitable for use in tanks with capacities ranging from 1m³ to 2000m³.
Designed to accommodate various flow characteristics and a wide range of viscosities.



Mechanimix offers a wide range of industrial agitators tailored to the needs of various industries. With different model options, it provides the most suitable mixing solution for every application.

