

Static Mixer | SB-F Series

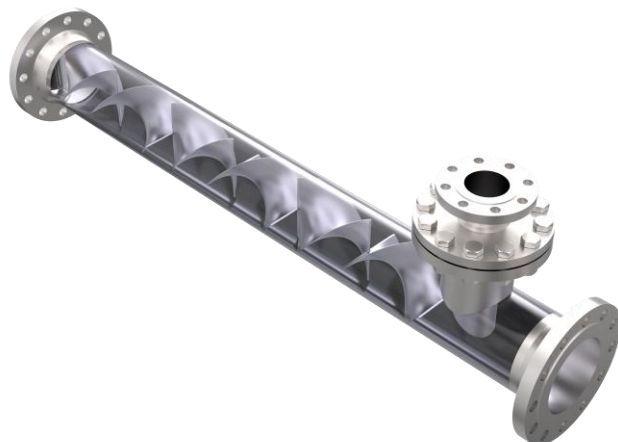
Professional Mixing Technologies

Static Mixer Overview

A Static Mixer is a new-generation industrial mixing device that creates highly efficient, fast, and uniform mixing without any moving parts—simply by guiding the flow through precisely engineered internal elements.

These mixers are low-cost, low-maintenance, and highly efficient, making them the ideal choice for continuous processes that demand consistent quality, reliable performance, and high operational efficiency.

From simple homogenization to complex reaction processes, static mixers provide a durable, economical, and technically optimized solution for modern industries.



Pipe Diameter	Up to DN 1500 (NPS 60)
Mixing Length	Up to 10 meters per section
Mixing Efficiency	Up to 95–99% homogeneity
End Connections	Flanged / Welded / Threaded
Injection Ports	1 to 3 Connections
Element Geometry	Helical / Cross-Lattice / Baffle / Custom
Temperatures	up to 500°C
Pressure Rating	Up to Class 1500 (Custom on request)
Materials	SS304, SS316L, Duplex, Alloy, etc.
Industries	Chemical, Food, Polymer, Pharmaceutical, Water Treatment, Mining

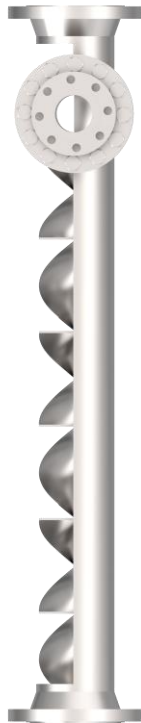
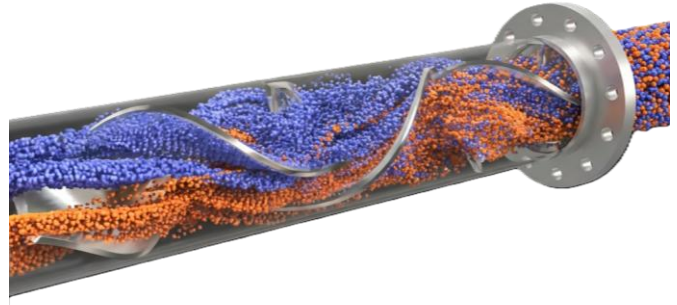


General Features

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Features

- Static design with engineered mixing elements
- Continuous mixing with short installation length
- Broad material selection (stainless steels & alloys)
- Customizable for pressure and temperature conditions
- Multiple end-connection options
- Full DN/NPS pipe size compatibility
- Optional injection/sampling/sensor ports
- Suitable for both laminar and turbulent flow regimes
- Compliant with ASME/DIN/ISO standards

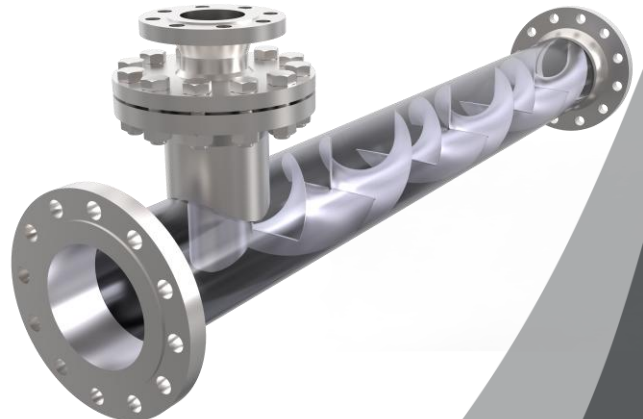


Advantages

- Zero maintenance required
- Extremely low energy consumption (no external power)
- High mixing uniformity and stable product quality
- Lower capital and operating cost vs. mechanical mixers
- Excellent corrosion and harsh-environment resistance
- Long service life with no wear components
- Easy retrofit into existing pipelines
- High resistance to fouling and hydraulic shock

Applications

- Liquid-liquid and gas-liquid mixing in chemical processes
- Chemical dosing, injection and line homogenization
- Temperature equalization before heat exchangers
- pH control and additive dosing in water treatment
- Polymer, resin and viscous fluid blending
- Food and pharmaceutical fluid processing
- Gas distribution, degassing and aeration
- Pre-reactor mixing for enhanced reaction performance



CFD Studies

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Process Direction →

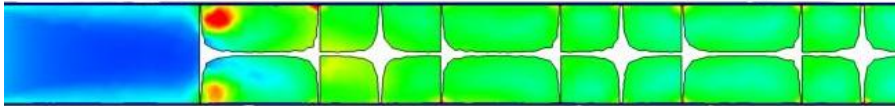
Pressure Drop Analysis

- Uniform and stable pressure distribution
- Significantly reduced pressure drop vs. conventional designs
- Smooth, fluctuation-free flow throughout the mixer
- Stable across flow rates
- Geometry optimized for lower pumping energy



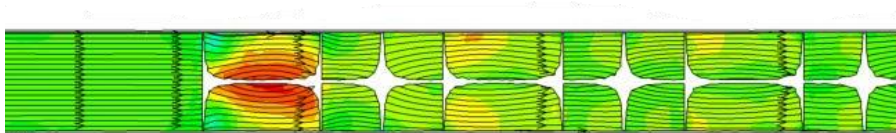
Mixing & Homogeneity

- High outlet concentration uniformity
- Rapid mixing-index rise
- Complete elimination of dead zones
- Homogeneous distribution across entire cross-section
- Improved final product quality
- Reduced residence length needed for full mixing



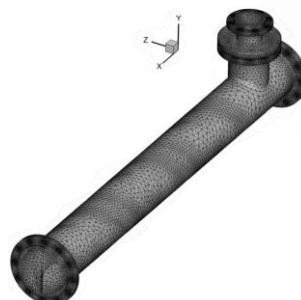
Velocity Field / Streamline

- Controlled flow patterns generating effective shear
- Targeted turbulence for enhanced mixing
- Continuous flow splitting and reorientation
- Balanced velocity field to prevent clogging
- Stable flow pathways for higher efficiency



Computational Fluid Dynamics (CFD)

CFD analysis can be performed on real pipe geometries and actual process conditions to accurately evaluate the expected process performance. **Mechanimix** has many years of experience in conducting advanced CFD simulations.



Customizable Aspects

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Connection Options

Category	Option Type	Available Options
Flanged Connections	ASME/DIN Flanges	Weld-Neck, Slip-On, Blind, Lap-Joint, etc.
Threaded Connections	NPT/BSP Threads	Threaded couplings & adapters

Mixing Element Options

Type	Available Options
Helical Elements	Standard Helix, Double Helix, Low-Pitch Helix, Tight-Pitch Helix
Elliptical Elements	Perforated Plate, Alternating Plates, Offset Plates, Corrugated Plate
Cross Element	Four-Blade, Multi-Cross (Double X), Twisted Cross-Blade, Perforated Cross, etc.
Baffle Elements	Chevron (V-Baffle), X-Baffle, Wavy/Corrugated Plate, Flat Plate

Modular Mixer Engineering

Feature	Description
Inlet / Branch Module	All inlets, chemical injection points, and branch connections can be built as a dedicated T- or Y-type module, separate from the mixing section.
Dedicated Mixing Element Tube	The mixing elements can be fully welded inside an independent mixing tube, which is then connected to the main pipeline via flanged joints for easy installation and maintenance.
Removable Cartridge System	In addition to welded modules, we offer a non-permanent, slide-in/slide-out cartridge design, allowing the mixing elements to be inserted and removed without any cutting or welding.
Easy Element Replacement	This cartridge configuration allows fast replacement or upgrade of mixing elements (Helical, Cross-Lattice, Baffle, etc.) without disassembling the entire pipeline – ideal for multi-purpose plants or processes requiring adjustable mixing intensity.
Multi-Section Assembly (Staged Length Design)	For large diameters or extended lengths, the mixer can be fabricated in multiple 2–6-meter sections, assembled on-site using ASME/DIN flanges.
Multi-Module Mixing Stages	When required, multiple mixing cartridges can be placed in series to achieve higher shear, greater uniformity, or staged chemical reactions.



Applications

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Industry	Applications
Chemical	- Absorption, reaction, and mixing of source gases - Mixing and reaction of liquid materials - Dilution of liquid chemicals - Mixing and reaction of various gases - Production of emulsified and blended fuel oils - Deoxidization using nitrogen gas; water-solution deoxidation - Aqueous ammonia production; ozone water generation - Resin polymerization processes - Heating and cooling of viscous materials - Neutralization and purification of acids and alkalis - Warm-water and hot-water production
Food	- Mixing of materials (liquid-liquid, liquid-solid mixtures, liquid-gas dilutions) - Proportional blending of solid materials - Cooking of materials by direct or indirect heating and disinfection - Constant material flow for securing disinfection time (plug flow) - Warm-water and hot-water production (CIP) - Tempering of chocolate - Dissolution of powdered ingredients - Deoxidization using nitrogen gas; deoxidization of water solutions - Absorption of carbon dioxide - Production of ozone water
Polymer	- Polymerization, condensation, and related reactions - Cracking (molecular-weight reduction) - Mixing of additives - Homogenization of polymer solutions - Flow adjustment and inline mixing for injection molding machines - Heating and cooling of materials and intermediates
Pharmaceuticals	- Dilution and mixing of crude materials and stock solutions - Mixing of crude materials - Warm-water and hot-water production (CIP) - Deoxidization by nitrogen gas; deoxidization of water solutions and products - Heat inactivation of recovered enzymes - Heating and cooling of paste or jelly-like materials and products
Water Treatment	- pH adjustment - Aeration (oxygen saturation) and microbubble generation - Addition of chemicals to water - Mixing of coagulants into water - Ozone-water production - Disinfection of water supply using sodium hypochlorite



Scalable Static Mixers

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Designed for pipelines operating from small to industrial-scale flow rates, ensuring uniform performance in all conditions.
Handles a wide range of viscosities and flow behaviors while maintaining stable, efficient mixing.



Mechanimix provides fully customizable static mixers engineered to meet the process requirements of a wide variety of industries.
With multiple design configurations and mixing element options, it ensures the ideal mixing performance for every application.

