PerMix
Perfect Mixing Technologies

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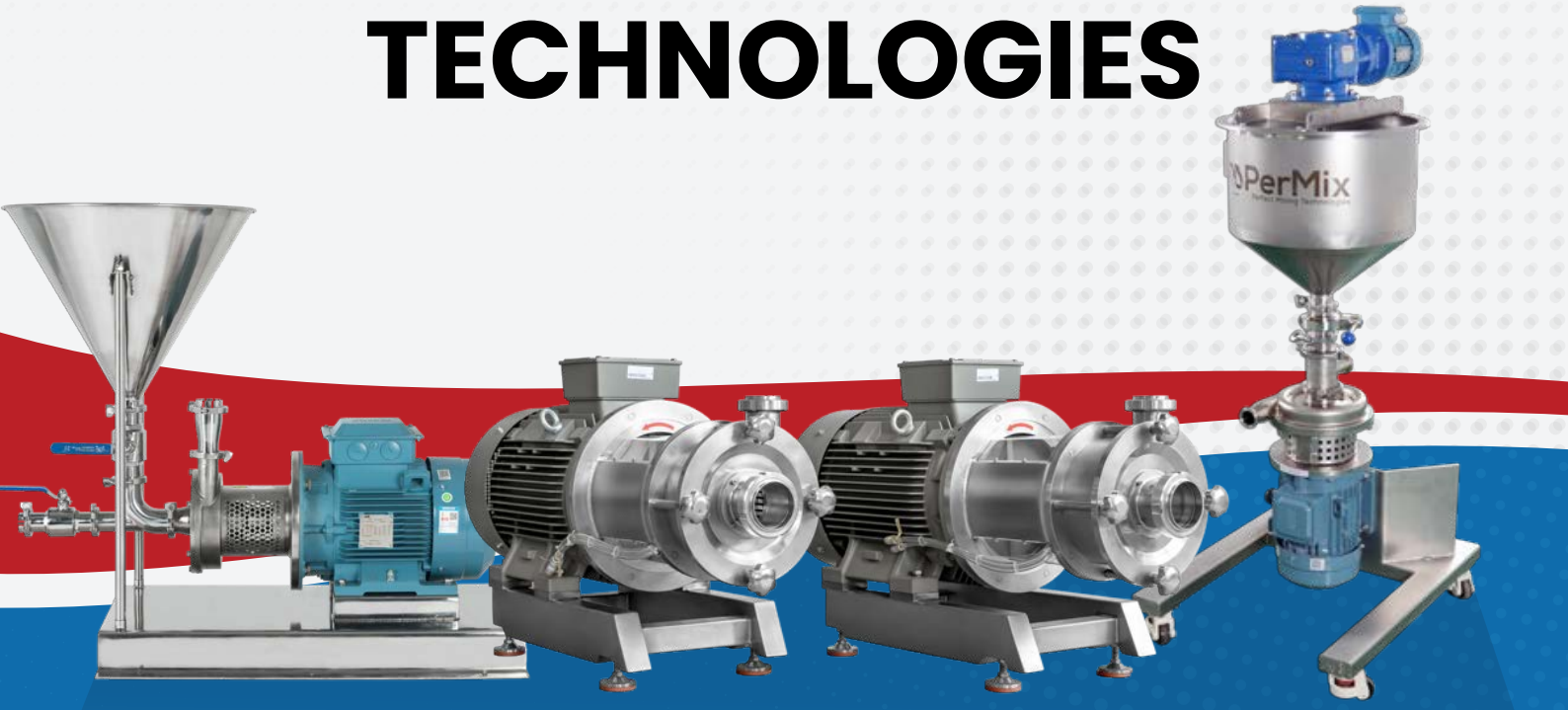
PERFECT MIXING TECHNOLOGIES



PERMIX INLINE PROCESSING SYSTEMS: PRECISION MIXING FOR EVERY INDUSTRY

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Continuous High-Performance Mixing, Emulsifying, Powder Induction & Shear Pump Technology

Modern manufacturing is no longer about simply blending ingredients together. It is about controlling particle size, droplet distribution, hydration rate, dispersion quality, process time, energy consumption, sanitation, and scalability.

Inline processing changes the game.

Instead of relying on large batch tanks where energy is dispersed across an entire vessel, inline systems focus mechanical energy inside a precisely engineered chamber. This concentrates shear forces exactly where they are needed, dramatically improving efficiency and reducing process time.

PerMix Inline Systems are engineered to:

- Deliver controlled, repeatable shear
- Reduce mixing time
- Improve product stability and shelf life
- Eliminate agglomerates
- Increase powder incorporation efficiency
- Integrate into new or existing production lines
- Meet hygienic and regulatory standards

These systems install directly into process pipelines and operate continuously or in recirculation mode.

Inline Homogenizers & Emulsifiers

What They Are

Inline homogenizers and emulsifiers are high-shear rotor-stator systems designed to reduce particle size and create stable dispersions or emulsions.

They are used when two or more immiscible phases must be combined — such as oil and water — or when solid particles must be reduced and uniformly distributed within a liquid.

Unlike static mixers or propeller agitation, inline homogenizers apply intense mechanical and hydraulic shear inside a controlled chamber. The entire tank volume does not need to be mechanically agitated at high power; instead, the product is processed as it flows through the mixing head.

This is far more energy efficient and far more precise.

What They Do

Inline homogenizers and emulsifiers:

- Break down droplets to micron-level sizes
- Reduce particle size in suspensions
- Create stable emulsions
- Improve texture and mouthfeel
- Increase product stability
- Prevent separation over time
- Reduce required emulsifier additives
- Improve reaction kinetics in chemical processes

The smaller and more uniform the droplet or particle size, the more stable and consistent the final product becomes.

How They Work (The Physics)

At the center of the system is a high-speed rotor spinning inside a stationary stator. The rotor may rotate at several thousand RPM, generating tip speeds that create intense shear zones.

Step 1: Induction

As the rotor spins, it creates a powerful suction that draws product into the mixing chamber.

Step 2: Acceleration

Centrifugal force accelerates the material outward at high velocity.

Step 3: Shear & Impact

Material is forced through narrow precision gaps between rotor and stator teeth. Velocity differentials between moving and stationary components create mechanical shear, hydraulic shear, and turbulence.

Step 4: Discharge

Material exits in a finely dispersed state.

Multi-stage configurations amplify this effect. Each additional stage increases the shear exposure, allowing finer droplet size and more efficient dispersion.

The result is faster emulsification and improved consistency compared to conventional tank agitation.

Where They Are Used

Food & Beverage

Sauces, mayonnaise, dressings, dairy emulsions, plant-based milks, ice cream mixes, beverage concentrates.

Pharmaceutical & Biotechnology

Vaccines, injectables, suspensions, topical creams, liposomal formulations.

Cosmetics & Personal Care

Lotions, creams, shampoos, gels, emulsified serums.

Chemical & Industrial

Resins, coatings, pigments, nano-dispersions, silicone emulsions, bitumen modification.

Wherever droplet size and uniformity matter, inline homogenization becomes essential.

Specifications

Single-stage, PC-1

Model	Inlet (ISO 1127)	Outlet (ISO 1127)	Flow, TPH (Water)	kW	Speed @50Hz	L, mm	W, mm	H, mm	Kg
PC-1/080K	DN32	DN25	1.5	1.5	3000	580	220	365	45
PC-1/100K	DN40	DN32	3	2.2	3000	580	220	365	75
PC-1/120K	DN40	DN32	4	4	3000	670	270	420	85
PC-1/140K	DN50	DN40	5	5.5	3000	760	300	455	150
PC-1/165K	DN50	DN40	8	7.5	3000	760	300	455	250
PC-1/180K	DN65	DN50	12	11	3000	850	340	530	300
PC-1/185K	DN65	DN50	18	15	3000	850	340	530	350
PC-1/200K	DN65	DN50	25	22	3000	950	360	610	400
PC-1/210K	DN80	DN65	35	30	1500	1550	550	650	650
PC-1/230K	DN100	DN80	50	45	1500	1600	600	750	700
PC-1/245K	DN100	DN80	75	55	1500	1700	700	750	750
PC-1/260K	DN125	DN100	90	75	1500	1800	700	850	800
PC-1/280K	DN125	DN100	110	90	1500	1900	700	900	900
PC-1/290K	DN150	DN125	130	132	1500	2200	800	950	1000

Three-stage, PC-3

Model	Inlet (ISO 1127)	Outlet (ISO 1127)	Flow, TPH (Water)	kW	Speed @50Hz	L, mm	W, mm	H, mm	Kg
PC-3/080K	DN32	DN25	1.5	4	3000	850	350	450	120
PC-3/100K	DN40	DN32	3	5.5	3000	1000	400	500	200
PC-3/120K	DN40	DN32	4	7.5	3000	1100	400	500	250
PC-3/140K	DN50	DN40	5	11	3000	1250	400	550	350
PC-3/165K	DN50	DN40	8	18.5	3000	1450	450	550	450
PC-3/180K	DN65	DN50	12	22	3000	1610	450	600	550
PC-3/185K	DN65	DN50	18	30	3000	1850	550	650	650
PC-3/200K	DN65	DN50	25	45	3000	1900	600	750	700
PC-3/210K	DN80	DN65	35	55	1500	2000	700	750	750
PC-3/230K	DN100	DN80	50	75	1500	2100	700	850	800
PC-3/245K	DN100	DN80	75	90	1500	2200	700	900	900
PC-3/260K	DN100	DN80	90	110	1500	2500	800	950	1000
PC-3/280K	DN125	DN100	110	132	1500	2700	900	1100	1200

INLINE POWDER INDUCTION MIXERS
(High Shear & Low Shear Configurations)

What They Are

Inline Powder Induction Mixers are systems engineered to incorporate powders into liquids rapidly and efficiently, without lumping, floating, or dusting.

Powder hydration is one of the most difficult steps in liquid processing. Many powders — especially gums, proteins, starches, and fine mineral solids — resist wetting and tend to form surface agglomerates known as "fish eyes."

Once formed, these lumps are difficult to break apart.

Powder induction mixers eliminate this issue by combining vacuum-assisted powder draw-in with immediate high-shear dispersion.

What They Do

- Pull powder directly into liquid stream
- Prevent floating and surface clumping
- Wet and disperse powders instantly
- Reduce hydration time
- Improve safety by reducing airborne dust
- Increase throughput
- Minimize operator handling

By introducing powder directly into a high-energy shear zone, the system ensures immediate contact between powder particles and liquid, preventing agglomeration.

How They Work

As liquid passes through the rotor-stator system, a localized vacuum zone is created at the inlet.

Powder is drawn into this vacuum region and immediately encounters intense shear. Instead of floating on the liquid surface, it is forced into dispersion at the exact moment of contact.

Different configurations allow customization:

High Shear Designs

Used for difficult-to-wet powders such as xanthan gum, CMC, proteins, carbomers, and fine mineral solids.

Low Shear Designs

Used for high-volume incorporation where aggressive particle size reduction is not required but high flow rates are important.

Two-Pump Designs

Combine a self-priming liquid pump with inline shear for improved suction and transfer.

Shear Pump Configurations

Compact systems for hygienic applications requiring both transfer and dispersion.

Industries Served

Food & Beverage

Milk powder reconstitution, starch slurries, syrup preparation, yogurt premix, flavor blending.

Pharmaceutical

Excipient dispersion, suspending agents, API incorporation.

Nutraceutical

Protein hydration, collagen dispersion, botanical extracts.

Chemical

Pigment wetting, fertilizer slurry preparation, bentonite dispersion.

Powder induction technology dramatically shortens hydration time and reduces rework.

Specifications

PT-C/Q-HS Direct Drive (Double Wall Design), with High Shear Stator/Rotor

Model	Hopper, L	Flow, TPH (Water)	kg/min (powder)	kW	RPM	L, mm	W, mm	H, mm	Kg
PT-C/Q-HS-080D	10	1.5	1~5	2.2	3,000	700	600	1,100	150
PT-C/Q-HS-100D	10	3	2~10	3	3,000	750	660	1,200	170
PT-C/Q-HS-120D	20	4	3~15	5.5	3,000	850	750	1,400	280
PT-C/Q-HS-140D	20	5	5~20	7.5	3,000	920	850	1,600	350
PT-C/Q-HS-165D	30	8	7~30	11	3,000	1,000	900	1,700	450

Note: During the powder incorporation, the back pressure at the outlet should be less than 0.2bar (2m water column).

Specifications

PT-C/Q-HS V-Belt Drive (Double Wall Design), with High Shear Stator/Rotor

Model	Hopper, L	Flow, TPH (Water)	kg/min (powder)	kW	RPM	L, mm	W, mm	H, mm	Kg
V-belt Drive:									
PT-C/Q-HS-080VB	10	1.5	1~5	2.2	3000	750	450	770	180
PT-C/Q-HS-100VB	10	3	2~10	3	3000	800	500	850	200
PT-C/Q-HS-120VB	20	4	3~15	5.5	3000	920	600	980	320
PT-C/Q-HS-140VB	20	5	5~20	7.5	3000	1,000	700	1,100	400
PT-C/Q-HS-165VB	30	8	7~30	11	3000	1,100	800	1,250	500
PT-C/Q-HS-180VB	30	12	10~50	15	3000	1,200	900	1,350	600
PT-C/Q-HS-185VB	30	18	12~80	18.5	3000	1,250	980	1,400	720
PT-C/Q-HS-200VB	40	25	15~120	30	3000	1,350	1,050	1,600	850
PT-C/Q-HS-210VB	40	35	18~220	37	3000/1500	1,400	1,150	1,650	900
PT-C/Q-HS-230VB	40	50	25~300	55	3000/1500	1,600	1,300	1,780	980
PT-C/Q-HS-245VB	50	75	30~400	75	3000/1500	1,700	1,400	1,900	1,100
PT-C/Q-HS-260VB	50	90	35~500	90	3000/1500	1,800	1,500	1,980	1,200
PC-1/290K	DN150	DN125	130	132	1500	2200	800	950	1000

Note: During the powder incorporation, the back pressure at the outlet should be less than 0.2bar (2m water column).

Specifications

PT-C/Y (Special Stator Rotor)

Model	Hopper, L	Flow, TPH (Water)	Powder, Kg/min (by hand wand)	kW	Speed	L, mm	W, mm	H, mm	Kg
PT-C/Y-120	10	10	1~5	11	3000	1200	450	500	300
PT-C/Y-140	20	20	2~20	15	3000	1500	500	550	500
PT-C/Y-165	30	40	3~30	37	3000/1500	1800	600	600	800
PT-C/Y-180	40	60	5~40	55	3000/1500	2000	850	800	1500
PT-C/Y-220	50	100	8~50	110	3000/1500	2200	1000	1000	2000

PT-C/F (Two Pumps Design)

Model	Hopper, L	Flow, TPH (Water)	Powder, Kg/min (by hopper)	kW (Mixer)	Speed (Mixer)	kW (Pump)	Speed (Pump)	L, mm	W, mm	H, mm	Kg
PT-C/F-120	40	4	3~15	4	3000	1.5	1500	1350	1000	1000	300
PT-C/F-140	60	6	5~30	5.5	3000	1.5	1500	1350	1000	1000	350
PT-C/F-165	80	8	10~50	7.5	3000	4	1500	1550	1080	1100	400
PT-C/F-180	80	12	20~70	11	3000	4	1500	1550	1080	1100	450
PT-C/F-200	100	25	30~95	22	3000	5.5	1500	1700	1200	1200	550
PT-C/F-210	100	30	35~100	30	3000	7.5	1500	1700	1200	1200	700

Note: During the powder incorporation, the back pressure at the outlet should be less than 0.2bar (2m water column).

SHEAR PUMPS

What They Are

Shear Pumps combine pumping capability with inline high-shear processing in a single compact system.

Where traditional centrifugal pumps simply move liquid, shear pumps simultaneously process and condition the product during transfer.
They are ideal when the process requires both movement and mixing.

How They Work

Product enters the pump housing and encounters a rotor-stator mixing head.

As the rotor spins, shear is generated inside the pumping chamber. Product is processed as it is transported.

This design reduces footprint, simplifies piping, lowers capital cost, and improves hygienic integrity.

What They Do

- Transfer product through process lines
- Maintain controlled flow
- Apply moderate to high shear
- Break down agglomerates
- Improve dispersion uniformity
- Enable tank-to-tank homogenization

This eliminates the need for a separate pump and inline mixer in many applications.

Applications

- Recirculating emulsions
- Tank equalization
- CIP return loops
- Inline blending
- Retrofit upgrades to existing process lines

Shear pumps are often the most efficient upgrade when improving an existing process without redesigning the entire system.

Specifications

Shear Pump PCH

Model	Hopper, L	Flow, TPH (Water)	Powder, Kg/min (by hopper)	kW	Speed @50Hz	L, mm	W, mm	H, mm	Kg
PCH-100	10	5	2~4	4	3000	680	350	520	95
PCH-130	20	10	5~10	7.5	3000	1000	500	800	200
PCH-160	30	20	10~18	15	3000	1250	600	1100	300
PCH-190	40	30	15~32	22	3000	1500	650	1250	400
PCH-210	50	40	20~50	45	3000/1500	1800	800	1500	550

Note: During the powder incorporation, the back pressure at the outlet should be less than 0.2bar (2m water column).

HYGIENIC DESIGN & COMPLIANCE

PerMix Inline Systems are engineered for sanitary and regulated industries.

Standard design features include:

- 316L stainless steel product contact parts
- Polished internal surfaces
- Sanitary clamp connections
- Clean-in-place compatibility
- Steam-in-place capability
- Double mechanical seals
- Thermosiphon seal cooling systems
- FDA-compliant elastomers
- ATEX and explosion-proof configurations
- GMP-ready construction

Designing for cleanability is as important as designing for shear performance.

Smooth internal geometries, minimized dead zones, and hygienic seals protect product integrity and simplify validation procedures.

ENGINEERING FLEXIBILITY & OPTIONS

Every application is different.

Viscosity, temperature, particle size, density, and flow requirements all influence design selection.

PerMix offers:

- Multi-stage rotor-stator assemblies
- Coarse, medium, and fine tooth configurations
- Variable frequency drives
- Jacketed housings
- High-temperature operation
- Vacuum-rated systems
- Skid-mounted turnkey packages
- PLC/HMI automation
- Instrumentation integration
- Custom metallurgy
- Pilot-scale testing and scale-up support

Systems can be engineered for continuous production lines or integrated into batch operations for recirculation processing.

WHY PERMIX

The inline processing market is competitive, but engineering discipline separates marketing claims from real performance.

PerMix focuses on:

- True rotor-stator customization
- Application-driven engineering
- Scalable solutions from pilot to production
- Global manufacturing capabilities
- Competitive pricing with uncompromised quality
- Rapid technical support

We do not offer generic inline mixers.

We design systems around process physics.

When particle size matters, when hydration time matters, when stability matters, when hygiene matters — engineering matters.

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Besides, PerMix has been building a network of agents located in Southeast Asia, Australia, Russia, Middle East, Africa, and other countries & regions.