We offer Perfect Mixing Technologies!

Mixing "Know-how" in Powder, Paste & Liquid - *Since 1954*

PerMix
Perfect Mixing Technologies

About Us

Welcome to PerMix, your reliable and professional supplier of industrial mixers & process equipment for any industry!

PerMix
Perfect Mixing Technologies

PerMix is a Chinese-Israeli cooperative venture with the famous Srugo family in Israel, who has been active and reputed in mixing technology since 1954. Therefore, our strong advantages over other competitors are 60 years of ***Designed-in-Israel*** know-how along with competitive ***Made-in-China*** prices!

PerMix means Perfect Mixing Technologies!

HISTORY:

About SRUGO (Israel):

SRUGO MACHINES ENGINEERING was established in 1954 in Argentina by the late industrialist, Mr. Jakob Srugo. In 1965 the company moved to Israel and operated from Bat-Yam. In 1977 SRUGO moved to Netivot and since then operated in a modern plant with an adaptable production line to provide an efficient solution for each customer's requirements. SRUGO started to export its products since 1990 to Western Europe, United States, Australia, Eastern Europe, the Middle East and several developing countries.

About PerMix:

In 2010, Mr. Arie Srugo, the second generation of SRUGO family, sold the whole company. After three years validity period of confidential agreement, he decided to work with a Chinese company in 2013, in order to take the advantage of the lower cost with SRUGO's proven technology, and then he and his partner founded PerMix, and targeted this company to be present in global market.

Presence & Prospect:

PerMix Tec Co., Ltd. is established as the professional supplier of industrial mixing equipment and systems. Our state-of-the-art technology and know-how in this section is originally from Israel; along with the low labor cost advantage in China, PerMix is born to be your partner for the cost effective solutions to liquid, paste and powder mixing applications.

- PRODUCT RANGE:

We are not only able to offer the single machine with modern appearance and advanced technique, but also to offer the full line system to save your time, which is one of our strong points. With our engineers' decades of experience in this area, PerMix is capable to offer the most suitable solution for any industry that has a demand for mixing.

- CUSTOMIZED SOLUTIONS:

Despite the standard range, we are able to design the equipment according to the specific requirements of our customers. PerMix engineers evaluate the customer's mixing and processing problems in order to translate process parameters into soundly engineered and dependable mechanical equipment.

PerMix welcomes the opportunity to discuss specific problems and invites customers to compare and determine for themselves which equipment is most suitable for their needs.

- APPLICATIONS:

PerMix has been building a good reputation in both local and export markets over these years. Our products are widely used to serve a variety of industries such as fine chemicals, specialty chemicals, petrochemicals, painting, ink, cosmetics, pharmaceuticals, agriculture, food, beverage, biology, nano materials, paper, adhesive, plastic, electronics, batteries, wastewater, etc.

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Liquid Dispersing & Mixing:



Paddle & Ploughshare Mixer

PTP-3000 Paddle Mixer with Choppers

INTRODUCTION:

PerMix Turbulent Mixer family has two variants, the **PTS series Ploughshare Mixer** and **PTP series Paddle Mixer**. These two mixers resemble each other, but with different designs of mixing agitator, thus the applications can be different.

PerMix **PTS** and **PTP Mixers** are both very versatile mixing machines, and proven to be able to handle nearly all types of materials including dry materials, powdery, granular, short fibered substance, moist solids with liquids, pasty material and highly viscous masses.

These two mixers can be used for numerous processing, including compounding, fine mixing, dispersing, deaerating, tempering, accelerating chemical or physical reactions, granulating, breaking down agglomerates, etc. It is particularly suitable for difficult processes as mixing trace elements in proportions of up to 1 in 1,000,000 parts, which means you can get the desired mixture proportion of components in as small as 1 g with a batch of 1000kg.

DIFFERENCE BETWEEN PTS & PTP:

The main difference between PerMix **PTP Mixer** and **PTS Mixer** is the mixing element: **PTS Mixer** uses the plough shaped element, while **PTP Mixer** uses the paddle element.

Due to different design of element, **PTP Mixer** generates gentler mixing (for turbulence sensitive particles) and requires less power consumption. Besides, PerMix **PTP series Paddle Mixer** has a better performance when the materials are with liquid and viscous, for example, slurries; this is because the conventional plough mixing element tends to be sticked and wrapped by the viscous materials while the paddle agitator of **PTP Mixer** doesn't.

PTS-100 Plow Mixer, All in SS

BASIC CONSTRUCTION:

PerMix **PTS & PTP Mixers** consists of a centrally mounted horizontal shaft that rotates within a cylindrical container, ploughs or paddle shaped mixing elements are attached to the centrally mounted shaft, special openings at the top for feeding materials, flush fitting access doors at the front of the mixer, a flush fitting discharge valve at the bottom of the mixer which is pneumatically or manually operated, and a complete drive unit.

Paddle & Ploughshare Mixer

OPERATION PROCESS:

The mixing container is filled from 30% to 70% capacity, allowing space for individual particles to be dispersed within the main area of the mixer. The plough or paddle shaped mixing elements create intense axial and radial movement causing the product to move throughout the mixing space. The shape and angle, together with the adjustment and rotation of the mixing elements and drum wall, cause the product to be lifted off the surface of the drum wall. The product is automatically discharged while the machine is still running so that any segregation is prevented.

SPECIAL DESIGN WITH CHOPPERS:

The installation of PerMix **Multi-chopper** in the basic **PTS or PTP Mixer** enables the breaking down of agglomerates during the mixing process. Together with the mixing element, the PerMix **Multi-chopper** removes lumps in the initial product, chops pasty adhesives and hinders the formation of agglomeration during the moisturizing of powdered substances. **Multi-chopper** is operated independently by its own motor.

LAB & PILOT APPLICATIONS:

PTS-5 (lab-size)

PTP-100 (pilot-size)

PerMix is able to offer lab & pilot size **PTS & PTP Mixers** for Research & Development purpose. The small size machine is very helpful for customers when the ingredients for R&D are expensive, and to meet the budget limit at the first stage.

With the good performance of the lab & pilot mixer, it is easy to scale up for a medium size or even bigger one.

FEATURES & OPTIONS:

- Different types of mixing element for a variety of materials

PerMix provides mainly two types of mixing elements: plough (for **PTS Mixer**) and paddle (for **PTP Mixer**). Both have their own advantages: the plough shaped element can easily penetrate through the dense and thick powder or paste materials, while the paddle element can cover an even wider range of viscosity.

PerMix plough shaped element

- Construction material

We are able to offer mixers with contact part to be built by Carbon steel, SS304, SS316/316L, Titanium, Duplex stainless steel, Hastelloy, etc. For abrasive materials we offer hardened steel as the contact part. Also we produce mixers all by stainless steel in order to meet the high hygienic requirement.

PerMix paddle element



Paddle & Ploughshare Mixer

- Continuous operation

We can supply machines for continuous work when a large capacity per hour is needed for the same material. Continuous mixers differ from batch mixers in that the mass flow of the product is from the inlet of the container to the discharge at the opposite end.

- Feeding & Discharging

A variety of feeding & discharging methods can be selected by the customers (e.g. manual, pneumatic, electrical operation).

- Heating/Cooling jacket

Jacketed trough for heating/cooling operation by electrical heater, thermal oil or steam

- Vacuum drying & deaerating

The mixer can be designed for vacuum drying & deaerating for special applications.

- Spray nozzle & Dripping pipe

Light liquid can be added into the powder by spray nozzles, and viscous liquid can be added by dripping pipe.

- Drive system

Drive system by geared motor, cycloidal reducer, worm reducer, belt or chain transmission, etc.

- Extended height bases

Height of our mixers can be defined individually.

PTP-750 Paddle Mixer with Dimple Jacket

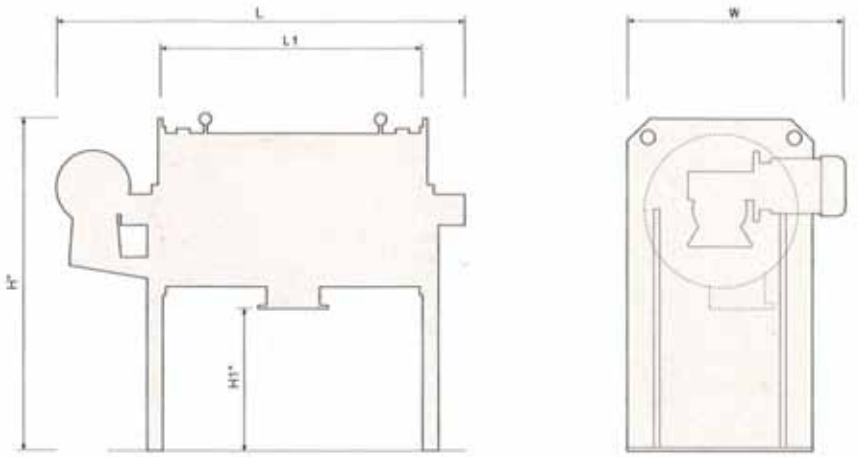
TYPICAL APPLICATIONS:

PerMix Mixer with Dripping Pipes

- **Dry powder mixing:** Food flavoring/additives, Sponge/cake mixes, Cosmetics, Pharmaceuticals, Cement, Powdered rubber
- **Paste mixing:** Biscuit creams, Dough, PVC pastes, Car body fillers/putties, Sugar/marzipan paste, Toiletry pastes, Tile adhesives and grouts
- **Mixing of wet slurries:** Filter cake re-slurrying, Dough, Fiber glass resin putty
- Wet granulation
- Liquid coating of powders and granules
- Fat and oil incorporation
- Vacuum drying
- Hot air drying

Paddle & Ploughshare Mixer

SPECIFICATION TABLE:



Model	Total vol. (liter)	Useful vol. (liter)	Power (kW) for PTP	Speed (rpm) for PTP	Power (kW) for PTS	Speed (rpm) for PTS	L1 (mm)	L (mm)	W (mm)	H1 (mm)	H (mm)
PTX-5L	5	3	1.1	0-582	1.1	0-582	180	800	500	-	-
PTX-10L	10	7	1.1	0-582	1.1	0-582	200	900	500	-	-
PTX-45	45	30	0.55	69	1.5	188	480	900	550	450	950
PTX-70	70	45	0.75	69	2.2	190	580	1,050	600	450	970
PTX-100	100	70	1.1	60	3	170	660	1,100	610	450	1,020
PTX-200	200	140	1.5	53	5.5	149	890	1,400	730	500	1,180
PTX-300	300	210	2.2	51	7.5	146	970	1,550	850	500	1,300
PTX-500	500	350	4	45	11	131	1,250	2,000	950	500	1,400
PTX-750	750	500	5.5	45	15	131	1,500	2,250	1,100	600	1,600
PTX-1000	1,000	700	7.5	33	22	101	1,900	2,600	1,150	600	1,800
PTX-1500	1,500	1,000	11	28	30	97	2,110	3,200	1,200	600	2,000
PTX-2000	2,000	1,400	15	25	45	97	2,110	3,500	1,350	600	2,200
PTX-3000	3,000	2,100	22	23	55	80	3,000	4,100	1,500	800	2,400
PTX-4000	4,000	2,800	30	17	75	80	3,000	4,200	1,550	800	2,600
PTX-5000	5,000	3,500	37	17	75	69	3,000	4,300	1,620	800	2,800

1. PTX means PTP or PTS.
2. PTX-L: laboratory size
3. kW, rpm, discharge clearance are changeable according to the customer's request.
4. All specifications and illustrations are as accurate as is reasonably possible, but they are not binding.
5. PerMix reserves the right to modify the design without notice.



Ribbon Blender

INTRODUCTION:

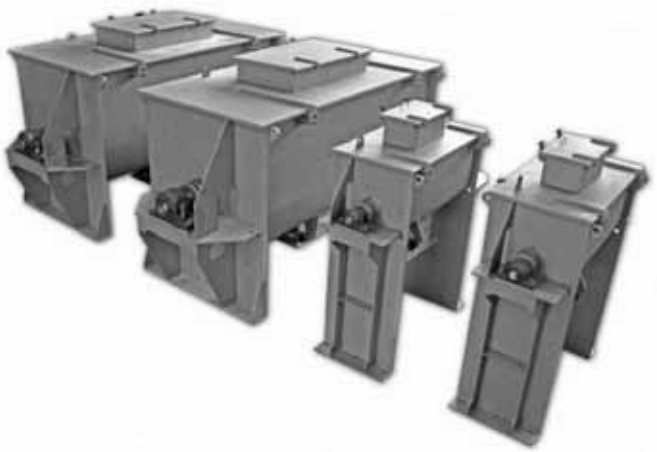
The PerMix **PRB series Ribbon Blender** is an efficient and versatile blending machine for mixing of dry powders, granules and viscous pastes homogeneously. It is able to give perfect result for mixing due to the innovative design of spiral agitator inside of its U-shape chamber.

PerMix designs our **PRB Ribbon Blender** which is able to achieve a maximum mixture ratio of 1:500,000, which means you can get the desired mixture proportion of components in as small as 1 gram with a batch of 500kg.

Due to its less aggressive mixing, **PRB Ribbon Blenders** ask for relatively lower power consumption compared with **PTS Ploughshare Mixers**.

BASIC CONSTRUCTION:

The basic unit of **PRB Ribbon Blender** consists of one electrical motor, one reduction gear, coupling, and shaft with spiral agitator. The shaft is sealed with bush & PTFE gland housing at both ends. Materials are loaded from top side, and the discharge is located at the bottom side in the center. The discharge height can be adjusted as per requirement, so that material gets discharged into the container below it without floating dust.



OPERATION PROCESS:

During the mixing operation of the **PRB Ribbon Blender**, materials are moved in a way that a part of them from center to the ends of container, while simultaneously the other part from end walls to the center; besides, materials are also lifted by the double-ribbon agitators and then drops by gravity. With such a three-dimensional motion, the total materials in the trough can be mixed efficiently within a short time.

FEATURES & OPTIONS:

- Construction material

We are able to offer mixers with contact part to be built by Carbon steel, SS304, SS316/316L, Titanium, Duplex stainless steel, Hastelloy, etc. For abrasive materials we offer hardened steel as the contact part. Also we produce mixers all by stainless steel in order to meet the high hygienic requirement.

Ribbon Blender

- Different types of ribbon for various applications

PerMix provides different ribbon types for various applications: standard ribbon agitator for center discharge, interrupted ribbon for high density materials, and continuous ribbon agitator for end discharge (for continuous operation).

- Safety approaches

PerMix designs our mixers with different approaches for operation safety in accordance with European and USA rules, which include: safety grid for loading port, interlocking system with limit switches, etc. Special requirements can be provided as options.

Other options including but not limited to: Continuous operation for large production scale; Vacuum drying & deaerating execution; Spray nozzle for liquid addition; Manual, pneumatic, or electrical feeding & discharging arrangements; A variety of drive system (geared motor, belt driven, chain driven); Extended height bases to fit into existing downstream equipment.

SPECIFICATION TABLE:

Model	Total capacity (liter)	Useful capacity (liter)	Power (*) (kW)	RPM	L (mm)	W (mm)	H (mm)	Outlet (**) (mm)	Weight (kg)
PRB-100	100	40-60	2.2	80	1,250	840	613	80x80	250
PRB-300	300	120-180	4	72	1,630	1,005	1,015	250x80	600
PRB-500	500	200-300	5.5	65	2,030	1,175	1,140	360x120	850
PRB-1000	1,000	400-600	11	50	2,460	1,455	1,375	360x120	1,300
PRB-2000	2,000	800-1,200	18.5	38	3,050	1,710	1,545	360x120	2,300
PRB-3000	3,000	1,200-1,800	22	35	3,500	1,865	1,680	360x120	3,300
PRB-4000	4,000	1,600-2,400	22	35	3,870	1,985	1,821	500x120	3,600
PRB-5000	5,000	2,000-3,000	30	30	4,090	2,062	1,945	500x120	4,620
PRB-6000	6,000	2,400-3,600	37	27	4,250	1,802	2,380	500x120	5,300
PRB-8000	8,000	3,200-4,800	45	24	4,590	1,956	2,504	700x120	6,800
PRB-10000	10,000	4,000-6,000	55	24	5,050	2,016	2,800	700x140	8,900
PRB-12000	12,000	4,800-7,200	55	20	5,500	2,160	2,753	700x140	9,520
PRB-15000	15,000	6,000-9,000	75	20	5,900	2,170	2,910	700x140	9,950
PRB-20000	20,000	8,000-12,000	90	17	7,180	2,690	2,830	700x140	13,500
PRB-25000	25,000	10,000-15,000	110	12	7,990	2,730	3,100	700x140	17,500
PRB-30000	30,000	12,000-18,000	132	12	8,450	2,860	3,300	700x140	19,500

1. (*) (**): Changes are available according to the customer's request.
2. All specifications and illustrations are as accurate as is reasonably possible, but they are not binding.
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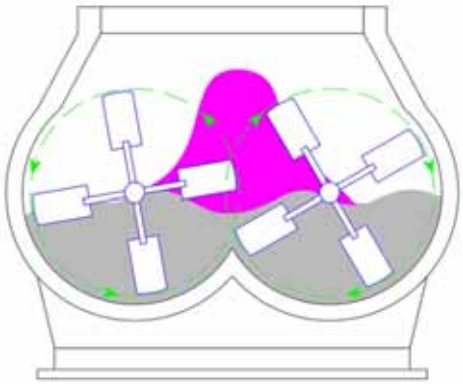
Fluidized Zone Mixer

INTRODUCTION:

The PerMix **PFB series Twin-shaft Paddle Mixer** is a fast solid mixing equipment with high efficiency, which can also be popularly known as Fluidizing Mixer, Fluidized Zone Mixer, Weightless Mixer, Non-gravity Mixer or Zero-gravity Mixer.

The **PFB series Twin Paddle Mixer** is applied to prepare a homogeneous mixture despite of particle size, shape and density. When the small amount of powder additives or liquid is required to be added into the bulk material, PFB Mixers are able to achieve fast and precision mixing with high capacity.

BASIC CONSTRUCTION:



The basic construction of **PFB series Fluidized Zone Mixer** consists of single motor/reducer with chain transmission, W-shaped horizontal trough with loading ports, twin-shaft with paddles, access door for inspection and maintenance, and a variety of discharge arrangement. Optional liquid adding nozzles are available to be installed on the top in order to mix the powder material with liquid ingredient.

SPECIAL DESIGNS WITH CHOPPERS

Although the PerMix PFB Mixer is featured by its gentle mixing at the weightless zone, it can also achieve rough mixings with additional PerMix Choppers (Pin Milling Bars) to be installed on the top of the paddles. The PerMix Choppers are two rapidly rotating bars with pins and a stationary shroud, which introduce high shear force onto the materials during mixing to break soft lumps and agglomerates. In this case, a fill level of 140% of batch capacity is normally required.

OPERATION PROCESS:

During operation of PFB Mixer, the two shafts are rotating in counter motion. The paddles sweep the entire bottom of the W-shaped trough, and materials are lifted floating between the two shafts (as zero-gravity zone) by the centrifugal force generated by the paddles. At this zero-gravity zone, materials of different density are mixed easily and fast because particles can move freely and randomly into each other, regardless of particle size and density. This results in a rapid and highly homogenous mixing.

Fluidized Zone Mixer

FEATURES & OPTIONS:

- Intensive mixing with additional chopper
- Fast mixing, typical mixing time is 10-60 seconds for dry and free-flowing materials
- Free particle movement at the “Fluidized Zone”
- Low shear for fragile products that can’t tolerate rough handling
- Easy cleaning and hygienic design with minimal blind corners
- Low maintenance efforts required
- Air purge packing seal for the shaft (Option)
- Spraying system for liquid additional (Option)
- Bomb-bay door for fast and complete discharge (Option)
- Special treatment of the shaft and paddles for corrosive and abrasive materials (Option)

Bomb-bay door for fast & complete discharge

SPECIFICATION TABLE:

Model	Total capacity (liter)	Working capacity (liter)	Power (*) (kW)	L (mm)	W (mm)	H (mm)	Inlet (**) (mm)	Outlet (***) (mm)	Weight (kg)
PFB-50	50	20-30	0.75-2.2	-	-	-	-	-	250
PFB-150	150	60-90	1.5-4	-	-	-	-	-	300
PFB-300	300	120-180	3-4	1,242	1,278	1,025	1-Φ400	350X40	750
PFB-500	500	200-300	4-7.5	1,408	1,478	1,305	1-Φ400	500X90	1,000
PFB-1000	1,000	400-600	7.5-15	1,875	1,692	1,425	1-Φ500	500X90	1,550
PFB-2000	2,000	800-1,200	15-22	2,275	2,108	1,775	1-Φ500	500X90	2,500
PFB-3000	3,000	1,200-1,800	18.5-30	2,408	2,396	1,955	1-Φ500	500X90	2,900
PFB-4000	4,000	1,600-2,400	22-37	2,822	2,546	2,015	1-Φ500	500X90	3,600
PFB-6000	6,000	2,400-3,600	30-45	3,050	2,980	2,235	1-Φ500	500X90	5,600
PFB-8000	8,000	3,200-4,800	37-55	3,362	3,412	2,425	1-Φ500	800X200	7,100
PFB-10000	10,000	4,000-6,000	45-75	3,538	3,645	2,615	1-Φ500	800X200	8,000

1. Standard mixer is with overlapping paddles. Mixers with tangent paddles & dual drive available as per request.
2. (*) (**) (***): Changes are available according to the customer’s request.
3. All specifications and illustrations are as accurate as is reasonably possible, but they are not binding.
4. PerMix reserves the right to modify the design without notice.



Conical Screw Mixer

INTRODUCTION:

PerMix **PNA series Conical Screw Mixer** is a batch mixing equipment used widely in applications that require gentle mixing and minimal heat generation without any product distortion.

PNA Mixer is a highly efficient vertical powder mixer with low energy consumption for batch mixing of powder and granule with various particle sizes.

The PerMix **PNA series Conical Screw Mixer** is also called **Nauta Mixer**, named by its inventor Mr. J.E. Nauta. Because no seals or bearings are exposed in product zone, there is no risk of lubricant contamination.

HOW IT WORKS:

Inside view of Conical Screw Mixer

PerMix **PNA series Conical Screw Mixer** consists of drive unit, conical vessel, transmission assembly, screws, and discharge valve. A spiral screw (or two screws, three screws according to specified application) is located in parallel with the conical wall with fine gap, and screw length is almost the same as the cone side.

During the operation of the mixer, the screw (or screws), that is operated by two different driving units, rotates around the center of the cone. In addition, it rotates at a higher speed around its own axle, according to the planetary principle.

The self-rotation of the screw lifts the powder and granule upwards from the cone bottom to the top, and then the materials fall down by gravity; simultaneously, the revolution lets the screw reach every corner inside the cone without blind zone.

FEATURES & ADVANTAGES:

- High efficiency and excellent homogeneity with short mixing cycle time
- Most gentle mixing with low shear force, suitable for fragile and friction sensitive products
- Low heat generation, suitable for heat sensitive products
- No sealing or bearing is exposed to the product thus free of cross contamination by the lubricating liquids
- No minimum volume required for the Conical Screw Mixer
- End products can be discharged completely without any residual in the conical container.
- Much lower energy consumption compared with other types of powder mixers

Conical Screw Mixer

OPTIONS:

- Easy for cleaning with the cleanout door or spray system
- Double jacket is applicable for heating or cooling. With optional vacuum execution the Conical Screw Mixer can be used as a vacuum mixing dryer.
- Single, dual, or triple screw(s) are available depending on materials to be treated.
- A variety of discharge arrangements are available by manual, pneumatic or electrical operation.

SPECIFICATION TABLE:

Model	Total capacity (liter)	Working capacity (liter)	Power (*) (kW)	Diameter (mm)	H, total height (**) (mm)	Inlet (***) (mm)	Outlet (****) (mm)	Weight (kg)
PNA-200	200	120	2.2+0.37	888	1557	140	230	500
PNA-300	300	180	2.2+0.37	990	1722	180	230	550
PNA-500	500	300	3+0.55	1156	1991	200	230	600
PNA-800	800	480	4+0.55	1492	2256	250	300	950
PNA-1000	1000	600	4+0.55	1600	2432	300	300	1200
PNA-1500	1500	900	5.5+0.75	1780	2725	300	300	1350
PNA-2000	2000	1200	5.5+0.75	1948	3001	350	350	1500
PNA-2500	2500	1500	7.5+1.5	2062	3024	350	350	1800
PNA-3000	3000	1800	7.5+1.5	2175	3207	350	350	2100
PNA-4000	4000	2400	11+2.2	2435	4010	400	400	2500
PNA-5000	5000	3000	15+2.2	2578	4260	400	400	3000
PNA-6000	6000	3600	18.5+3	2715	4470	400	400	3500
PNA-8000	8000	4800	22+3	2792	5000	400	450	3800
PNA-10000	10000	6000	30+4	3000	5240	500	450	4300

1. (*) (**) (***) (****): Changes are available according to the customer's request.
2. Customized sizes available as per request
2. All specifications and illustrations are as accurate as is reasonably possible, but they are not binding.
3. PerMix reserves the right to modify the design without notice.



Vertical Ribbon Mixer

INTRODUCTION:

PerMix **PVR series Vertical Ribbon Mixer** has a similar appearance with the popular **Ribbon Blender**, but stands vertically.

PVR Vertical Ribbon Mixer is an efficient and versatile blending machine for batch mixing of free-flowing powders. It is able to give perfect result for mixing due to the innovative design of an outer spiral type mixing element with an inner reverse direction screw, rotating together inside a conical shape trough allowing a perfect discharge of the mixed material.

HOW IT WORKS:

The construction of **PVR Vertical Ribbon Mixer** is very compact: it consists of a cone vessel with the drive unit on the top and discharge valve at the bottom. In the cone vessel, there are a central tapered ribbon with very small clearance between its edge and the wall and additionally a screw mounted on the central shaft. The ribbon and the screw move the materials upward from the bottom to the top, where the materials then drop by gravity into the center. During this continuous operation, material particles and heat are exchanged quickly which leads to a homogeneous product. Besides, the material particles are mixed with minimal mechanical and thermal stress, which makes this type of mixer a good solution for fragile and heat sensitive product.

ADVANTAGES:

- High level of accuracy with minor component ratio to be 1:100,000
- Gentle mixing for sensitive materials without generation of heat
- No minimal quantity is required
- Full discharge with minimal residue, and easy to clean in either dry or wet way
- High heat transfer rate, ideal for heating or cooling process of the powders
- Chopper can be installed for intensive mixing and lump breaking

Inside view of Vertical Ribbon Mixer

SPECIFICATION TABLE:

Model	Total capacity (liter)	Working capacity (liter)	Power (*) (kW)	Diameter (mm)	H, total height (**) (mm)	Inlet (***) (mm)	Outlet (****) (mm)	Weight (kg)
PVR-100	100	70	1.5-2.2	708	1420	140	150	180
PVR-300	300	210	2.2-5.5	990	1998	180	230	460
PVR-500	500	350	4-7.5	1156	2268	200	230	510
PVR-1000	1000	700	5.5-11	1600	2742	300	300	1020
PVR-1500	1500	1050	7.5-15	1780	2580	300	300	1100
PVR-2000	2000	1400	11-18.5	1948	2825	350	300	1270
PVR-2500	2500	1750	15-22	2062	3020	350	400	1530
PVR-3000	3000	2100	18.5-22	2175	3200	350	400	1780

1. (*) (**) (***) (****): Changes are available according to the customer's request.
2. All specifications and illustrations are as accurate as is reasonably possible, but they are not binding.
3. PerMix reserves the right to modify the design without notice.

High Speed Mixer

INTRODUCTION:

The PerMix **PDI series High Speed Mixer**, also called Mixer Granulator, or High Shear Mixer Granulator, is an efficient and versatile blending machine for mixing of dry powders, or granulating with the addition of liquid binder, within a very short time and with excellent cleaning abilities. It is able to give perfect result for mixing due to the innovative design of a central Impeller type mixer with a side vertical Chopper.

The proven mixing action of the PerMix **PDI series High Speed Mixer** ensures effective mixing in may applications. Optimal performance is assured with dedicated designs of optional feeding, discharging and installation.

BASIC CONSTRUCTION:

The PerMix **PDI Mixer** consists of two electrical motors, one reduction gear, coupling, and shafts with the two agitators. The shaft is sealed with special sealing, sometimes with air purge, in a way that there is limited contact between the material and the seal. Materials are loaded from top side, and the discharge is located at the bottom side. Due to the consistent modular design, the system can be configured individually and easily adapted to the constructional circumstances and specific requirements.

HOW IT WORKS:

In a PerMix **PDI series High Speed Mixer**, the powders are set in a multi-dimensional shear flow state and it needs only short mixing time until they are thoroughly mixed. In case that granulation is required, the spraying system sprays the binder solution into the bowl to agglutinate with the materials and under the combined action of the impeller and chopper, uniform and porous granules are produced. After finishing the mixing or granulation process, powders/granules are discharged through the side discharge valve with no "dead zone".

SPECIFICATION TABLE:

Model	Total Volume, [Liter]	Operation Volume, [Liter]	Impeller Power, [kW]	Impeller Speed, [rpm]	Chopper Power, [kW]	Chopper Speed, [rpm]
PDI-10	10	6	2.2	381	1.1	1,500
PDI-50	50	30	4	288	1.1	1,500
PDI-100	100	60	5.5	277	1.5	1,500
PDI-200	200	120	7.5	193	3	1,500
PDI-300	300	180	11	176	4	1,500
PDI-400	400	240	15	176	5.5	1,500
PDI-600	600	360	22	149	5.5	1,500
PDI-800	800	480	30	124	7.5	1,500
PDI-1000	1,000	600	37	116	11	1,500
PDI-1500	1,500	900	55	99	18.5	1,500

1. All specifications are as accurate as is reasonably possible, but they are not binding.
2. Customized sizes are available against request.
3. PerMix reserves the right to modify the design without notice.



V-shaped Mixer

INTRODUCTION:

The PerMix **PVM series V shaped Mixer**, sometimes also called **Twin Mixer**, is one type of PerMix **Tumble Mixer** family (the other type is PerMix **PDC series Double Cone Mixer**), which is very popular for the intimate blending of free flowing dry powders, granules, and crystals. It is featured by the very simple design and easy to clean construction.

The PerMix **PVM series V shaped Mixer** features a gentle high-flowing mixing process for solids/solids in a proportion of up to 1:100.000 with the possibility of using an intensifier bar to enhance the mixture, and solids/liquids in powder or granulate form with different specific weights.

HOW IT WORKS:

The **PVM Mixer** has a V shape chamber made up by two cylinders. Powders and granules are fed into the chamber either manually or by a vacuum conveyor. A gear motor drives the chamber to roll in 360 degrees. This multi-dimensional motion makes the powders and granules inside tumbling up and down and colliding to each other all the time, and achieve uniform mixing in short time. For special applications and GMP use, we build the chamber as a Y shape.

ADVANTAGES:

The simplicity of design of the PerMix **PVM series V shaped Mixer** allows a low initial cost, easy maintenance and simple operation. It is available from the 2 liter laboratory to large industrial 6000 liter units. The PerMix **PVM series V shaped Mixer** can be supplied with a variety of accessories, including:

- Internal choppers
- Vacuum/Drying execution
- Spray unit
- Special safety fence
- Mobile trolley
- PLC control & touch screen

SPECIFICATION TABLE:

Model	Total Volume, Liter	Operation Volume, Liter	Power, kW	Length, mm	Width, mm	Height, mm	Operation Height, mm
PVM-5	5	3	0.25	810	500	660	770
PVM-15	15	7	0.37	700	525	1,100	1,150
PVM-45	45	20	0.55	1,000	760	1,300	1,400
PVM-100	100	50	0.75	1,200	990	1,500	1,630
PVM-200	200	100	1.1	1,560	1,240	1,715	1,890
PVM-300	300	150	1.5	1,750	1,400	1,900	2,000
PVM-500	500	250	2.2	2,200	1,600	2,550	2,825
PVM-700	700	350	3	2,400	1,900	2,720	2,970
PVM-1000	1,000	500	4	2,670	2,120	2,850	3,150
PVM-2000	2,000	1,000	5.5	3,550	2,680	2,280	2,660
PVM-3000	3,000	1,500	7.5	4,050	3,060	2,620	3,050
PVM-4000	4,000	2,000	11	4,450	3,350	2,880	3,300
PVM-5000	5,000	2,500	15	4,800	3,570	3,070	3,550

1. All specifications are as accurate as is reasonably possible, but they are not binding.
2. Customized sizes are available against request.
3. PerMix reserves the right to modify the design without notice.

Double Cone Mixer

INTRODUCTION:

Similar to PerMix **PVM series V-shaped Mixer**, the PerMix **PDC series Double Cone Mixers** are unique mixers suitable for rapid and uniform mixing of free flowing dry powders, granules and crystals. With the simplest structure among all mixers, they are featured for low investment, easy operation, discharging without residual, quick cleaning, and simple maintenance.

The PerMix **PDC series Double Cone Mixer** provides a gentle high-flowing mixing process for solids/solids in a proportion of up to 1:100.000 with the possibility of using an intensifier bar to enhance the mixture, and solids/liquids in powder or granulate form with different specific weights.

ADVANTAGES:

- Minimized distortion to the materials due to absence of any moving blades
- No contamination due to the closed area by only stainless steel walls
- Especially suitable to mix powders or granules which are temperature sensitive, easily oxidizable, crystallized, volatile, poisonous or with irritating smell
- Many options are available such as variable speed, automatic stop in discharge position, air operated valve, touch screen operating panel, safety fence, etc.

SPECIFICATION TABLE:

Model	Total Volume, Liter	Operation Volume, Liter	Power, kW	Length, mm	Width, mm	Height, mm	Operation Height, mm
PDC-5	5	3	0.25	810	500	660	770
PDC-15	15	7	0.37	600	430	1,265	1,335
PDC-45	45	20	0.55	850	620	1,540	1,650
PDC-100	100	50	0.75	1,100	810	1,620	1,950
PDC-200	200	100	1.1	1,400	1,020	2,100	2,280
PDC-300	300	150	1.5	1,600	1,160	2,320	2,530
PDC-500	500	250	2.2	1,630	1,070	2,600	2,600
PDC-700	700	350	3	1,820	1,200	2,770	2,770
PDC-1000	1,000	500	4	2,100	1,350	2,985	2,985
PDC-2000	2,000	1,000	5.5	2,620	1,350	2,145	2,280
PDC-3000	3,000	1,500	7.5	2,990	1,550	2,440	2,600
PDC-4000	4,000	2,000	11	3,280	1,680	2,685	2,850
PDC-5000	5,000	2,500	15	3,530	1,810	2,890	3,070

1. All specifications are as accurate as is reasonably possible, but they are not binding.
2. Customized sizes are available against request.
3. PerMix reserves the right to modify the design without notice.



3D Mixer

INTRODUCTION:

The PerMix **PTU series 3D Mixer** or Multi Direction Powder Mixer is used for homogeneous mixing of powdery substances with different specific weights and particle sizes. Producing dry-to-wet and wet-to-wet mixtures is also possible. The production process is hygienic and dust-free because the product is mixed in independent containers of variable sizes.

During the mixing process the powder moves on a random direction from center to the end of the trough and on the same time from top to the bottom. In such a multi-dimensional way, the PerMix **PTU series 3D Mixer** needs only short mixing time and relatively low power consumption.

The mixer's "Gentle" mixing action is good for final products that are sensitive to high shear of the mixer and tend to break or to reduce their particles size, or are highly abrasives.

ADVANTAGES & OPTIONS:

- Excellent homogeneity of the mixture due to interaction of rotation, translation and inversion, with no dead points, allows a complete discharge of the mixing tank with min. mixed material residue and easy cleaning.
- Sizes from 5 to 300 liters total volume as standard, but bigger size can be offered as per request.
- Speical design of trough holder for the interchangeable trough to be clamped onto the mixer, for fast change-over and free of contamination between batches
- On small models, interchangeable mixing trough with different sizes are possible, for example, PTU-15 mixer to be accommodated with trough of 5, 10, 15 liters
- Safety fence or cage to prevent human injury
- Easy to be converted with vacuum loading for GMP application

SPECIFICATIONS TABLE:

Model	Total Volume, Liter	Operation Volume, Liter	Power, kW	Shaft Speed, rpm	Length, mm	Width, mm	Height, mm	Weight, kg
PTU-5	5	4	0.25	28	600	1000	900	150
PTU-15	15	12	0.37	20	700	1000	1000	200
PTU-50	50	40	1.5	15	1120	1330	1220	500
PTU-100	100	80	2.2	12	1370	1550	1430	700
PTU-300	300	240	4	8	2000	2400	2100	1600

1. All specifications are as accurate as is reasonably possible, but they are not binding.
2. Bigger sizes are available against request.
3. PerMix reserves the right to modify the design without notice.

Drum Hoop Mixer

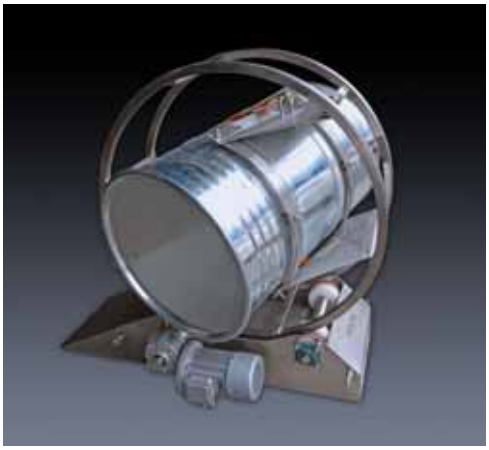
INTRODUCTION:

The PerMix **PDR series Drum Mixer** has been developed to meet increasing demands for a low batch mixer for mixing, blending, homogenizing, dyeing of dry powders and granules particularly in smaller industries or when frequent product changes as required. The PerMix **PDR series Drum Mixer** comprises a drive unit with roll-on / roll-off ramp and foot switch or timer.

PerMix **PDR Mixer** is used in mixing, homogenizing and dyeing of powdery or granulated components in the plastics industry, chemical industry, drug and dye works, food industry as well

Drum full volume of **PDR Mixer** is available with 50, 100 and 200 liters.

ADVANTAGES & OPTIONS:



- Intensive mixing even in the case of small quantities for example of additives or active substances
- Well suitable for frequent product changes, as the storage container at the same time serves as a mixing container
- Avoids inappropriate handling of dusty or tonic products
- Hoop can be used for transporting drum; extra hoop can be offered for fast change-over between drums
- No need for drum hoists, cradles, etc.
- Easy cleaning of the mixing drum
- Intensifying bar can be installed inside of the mixing drum for lump breaking.
- Safety fence or cage to prevent human injury
- Optional GMP execution

SPECIFICATION TABLE:

Model	Total Volume, Liter	Operation Volume, Liter	Max. Loading Weight, kg	Power, kW	Speed of Drum Hoop, rpm	L, mm	W, mm	H, mm	Weight, kg
PDR-50	50	35	30	0.55	30	1350	670	1185	130
PDR-100	100	70	60	0.55	25	1350	670	1185	130
PDR-200	200	140	120	0.55	20	1350	670	1185	130

1. All specifications are as accurate as is reasonably possible, but they are not binding.
2. Dimension/Weight information is without the drum.
3. Customized sizes are available against request.
4. PerMix reserves the right to modify the design without notice.



Vacuum Mixer Dryer

INTRODUCTION:

PerMix **PTP-D series Mixer Dryer** is a turbulent mixing reactor-dryer. It is used as a high-speed paddle dryer, chemical reactor or, if both processes are combined, as a dryer-reactor. They are used with particular success in agglomeration-free rapid drying, heterogeneous reactions with systems of different substances, extraction, sterilization and in general for vacuum, positive-pressure, thermal energy and comminuting aids.

PTP-D series Mixer Dryer are widely used in the chemical, metallurgic and pharmaceutical industries among others. Standard sizes range from 3 liters up to 5000 liters and pressure from 10 mbar up to 50 bar.

HOW IT WORKS:

PTP-D Mixer Dryer with front door open

The PerMix **PTP-D series Mixer Dryer** is used for drying operations usually operated at higher than critical speed, at any rate for fine drying after the phase change. In conjunction with the action of the rotary cutter and multichopper units, this causes a large degree of fluidization of the material to be dried and thereby promotes the evaporation of the fluids. The huge rate at which evaporation is effected practically eliminates the need for the usual auxiliary processes, such as scrubbing with solvents..

ADVANTAGES:

- Cost savings: The PerMix **PTP-D series Mixer Dryer** combines several machines: less pipe-work, fewer control and space requirements
- Short reaction times
- Optimum heat transfer via large contact areas
- Turbulent mixing by mechanical fluidization of reaction material
- No dead areas in reactor and the discharge areas
- The PerMix **PTP-D series Mixer Dryer** can also be supplied with removable mixing tools.
- Easy to clean and sterilize
- Long service life through the use of corrosion resistant reactor materials (Stainless Steels, Hastelloy, Titanium, Nickel Alloys)


Lab-size & Pilot size PTP-D Mixer Dryer

Nutsche Filter Dryer

INTRODUCTION:

The PerMix **PNF series Nutsche Filters**, or **Agitated Nutsche Filters** (ANF), are specially designed for solid - liquid separation. They are designed based on the principle of the well-known laboratory Buchner Funnel, but usually operating under either vacuum or pressure for many industrial applications.

By adding a heating system to the side walls and/or introducing a heated agitator, the **PNF Nutsche Filter** can be transformed into a highly efficient **Nutsche Filter Dryer**, which can process a concentrated slurry and discharge a dry powder.

The PerMix **PNF series Agitated Nutsche Filter** is designed as a versatile several-in-one system to perform a multitude of tasks including reaction, filtration, caking washing, and thermal drying, within a single unit.

ADVANTAGES:

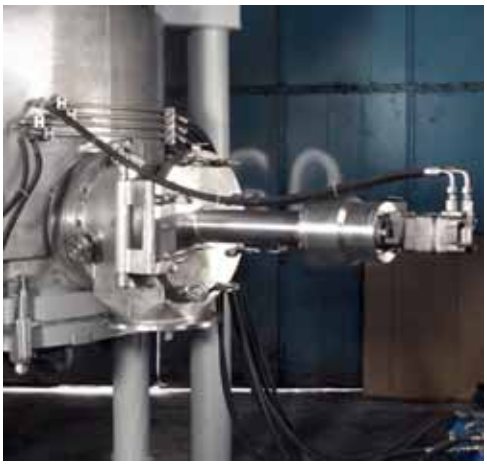
Inside view of Nutsche Filter

- Excellent cleanability capabilities using CIP systems
- An open filter base providing good access to the filter internals for cleaning and inspection
- Highly efficient drying due to unique underplate heating system
- Easily interchangeable filter plates, with flat, homogeneous filter surfaces for good cleaning and inspection
- Multilayer and/or conventional filter materials and good drying performance with special agitator design, large heat exchange areas
- Suitable for handling flammable, toxic, corrosive materials with extremely safe design

APPLICATIONS:

The range of PerMix **PNF series Agitated Nutsche Filter** is widely used in industries of fine chemical, pesticides, wastewater treatment, dyes and pharmaceuticals.

To meet the demanding requirements for filters used in the manufacture of pharmaceutical ingredients, the PerMix **PNF series Agitated Nutsche Filter** is designed to meet stringent cGMP and FDA guidelines.



Sigma Kneader Mixer

INTRODUCTION:

The PerMix **PSG series Sigma Kneader Mixer**, which is also known as **Double Arm Mixer**, **Sigma Kneader**, **Double Z-blade Kneader**, is used for the mixing-kneading of materials with very high viscosities (over 500,000 cps).

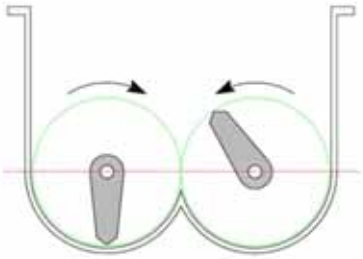
With its unique design of Z-shaped mixing tools installed in two semi-cylinders, the PerMix **PSG Kneader Mixer** is able to provide a combined functions of compressing, stretching, folding, kneading & mixing, which makes it widely used in the chemical, food, sealing compound and paint industries, among others.

HOW IT WORKS:

Inside view of a Sigma Kneader Extruder, with double-sigma blades and a screw extruder below for discharging

In the PerMix **PSG series Sigma Kneader Mixer**, there are two special designed Z-shaped rotating elements installed in a W-shaped chamber, the intersection of which forms a saddle piece and meeting tangentially just above the saddle. They rotate at different speeds (usually in the ratio of 3:2) and in opposite direction.

The mixing action is a combination of bulk movement, smearing, stretching, folding, dividing, and recombining as the material is pulled and squeezed against blades, saddle, and side walls. Continually new layers of material are compressed and folded over one another and are subjected to shearing forces. New surfaces are formed and the components can penetrate.



Sigma Kneader with blades working in counter-direction & tangential way

The blades, which are ground and polished, successively sweep all points of the trough surface during each revolution, at the same time dividing the batch continuously across the saddle piece and thereby rapidly affecting a perfectly homogeneous mix.

DISCHARGING ARRANGEMENT:

(1) Tiltable Tank

For small machines tilting mechanism can be of a mechanical type (hand-lever or hand-wheel), and for machines bigger than PSG-15, usually they are electro-mechanically or hydraulically powered.

Sigma Kneader Mixer

(2) Extrusion Screw

The extrusion-discharge screw is located in the saddle section and runs in a cylindrical trough tangential to, and below the 2 mixing blades.

During the mixing cycle the screw moves the material within the reach of the mixing blades, thus assuring a thorough blending of all the ingredients, and, at the same time, accelerating the mixing process.

At discharge time, the direction of rotation of the screw is reversed and the mixed material is extruded through suitable die openings in the side of the machine. The extrusion screw has its own separate drive so that blades and screw operate independently.

FEATURES & OPTIONS:

The large number of options available for the **PerMix PSG series Sigma Kneader Mixer** enable it to perform particular functions or operate as a general kneader:

- Tiltable tank
- Bottom extruder discharge
- Variable speed drive
- Hydraulic drive
- Special 'Duplex' kneading arms for intensive kneading
- Vacuum execution
- Double jacket
- Cored arms for heating & cooling
- Overlapping arms

SPECIAL 'DUPLEX' KNEADING ARMS:

PerMix offers **PSG-D series 'Duplex' Sigma Kneader Mixer** which is specially designed for even more intensive kneading applications.

They are twin basin kneading machines with two horizontally arranged kneading blades, which are deeply geared into one another and strip themselves reciprocally. The kneading blades are turning acc. to a ratio 1:2. Because of their different speeds, the blade sides approach and withdraw alternately. This causes high pressure tensile and shearing rates and therefore heavy friction in the kneading medium, which creates excellent dispersing and homogeneity. The shape of the kneading blades enables a steady flow of material from the side walls of the kneading trough to the middle of the kneading trough.

Duplex Sigma Kneader Mixer

Sigma Kneader Mixer

SPECIFICATION TABLE:

Model	Total Capacity (liters)	Working Capacity (liters)	Power (kW) [Arms]	Speed (rpm) [Arms]	Length (mm)	Width (mm)	Height (mm)
PSG-1	1	0.6	1.1	45/30	550	450	700
PSG-3	3	2	1.1	65/40	650	500	700
PSG-5	5	3.5	1.1	65/40	700	550	730
PSG-10	10	6	1.5	50/35	900	580	691
PSG-15	15	10	2.2	50/30	1053	623	861
PSG-50	50	30	1.5-5.5	42/27	1330	910	1350
PSG-100	100	60	2.2-7.5	42/27	1588	984	1452
PSG-150	150	90	3-7.5	42/27	1780	990	1600
PSG-200	200	120	4-11	42/27	1988	1000	1829
PSG-300	300	180	4-15	33/22	2730	1930	1745
PSG-400	400	240	5.5-18.5	33/22	2850	1950	1800
PSG-600	600	360	11-37	33/22	3070	2080	1870
PSG-800	800	480	11-45	33/22	3270	2250	1950
PSG-1000	1000	600	15-55	33/22	4080	1560	2055
PSG-1500	1500	900	18.5-75	28/19	4600	1700	2330
PSG-2000	2000	1200	30-75	28/19	5100	1850	2600

1) All specifications are as accurate as is reasonably possible, but they are not binding.
2) Arms speed can be specified by the customer.
3) Customized sizes are available against request.
4) PerMix reserves the right to modify the design without notice.

Mirrorlike polishing of contact parts

Sigma kneader built in all S.S.

Sigma mixer by tilting discharge

Double Planetary Mixer

INTRODUCTION:

The PerMix **PDP series Double Planetary Mixer** is also called double planetary kneader, because it can be used to handle very viscous materials up to 1,500,000 cPs. Usually the PerMix **PDP series Double Planetary Mixer** has two vertically mounted mixing tools which are driven by one gear to move around the central axe of the tank as well as their own axes.

The PerMix **PDP series Double Planetary Mixer** is so versatile that it can be used to mix, knead, stir and deaerate all types of material, including highly viscous pastes, even to granulate wet powders. Industrial pastes produces by the PerMix **PDP series Double Planetary Mixer** include concentrated paints and varnishes, printing inks, fillers, silicone and thiocole pastes, plastisoles, plastic coatings, synthetic lubricating greases and many other materials.

HOW IT WORKS:

In the mixing process, two vertically mounted mixing tools rotate around a common sun gear. In addition, they rotate at a higher speed around their own axes, according to the planetary principle. A swinging type scraper continually sweeps the inside wall, transporting material from the walls of the vessel to the mixing tools, and transferring the heat efficiently.

DESIGN FEATURES:

The standard finger-blade mixing tools are designed to work in an overlapping way, thus create strong axial and radial motions in the mix-product, as well as a highly intensive shearing and dispersing effect. Within a short time, the material is thoroughly mixed and even very difficult formulas may be obtained.

A quick vessel locking device connects the mixing vessel to the mixer. Because the vessel is mounted on fixed and swivel wheels, it is very easy to transport. The standard version of the **PDP Mixer** features dual mixing tools shafts running in heavy duty ball bearings. Both mixing tools and scrapers can be supplied with a special bayonet locking system for easy disassembly. The upper head of the machine is lifted by manual, mechanical or hydraulic elevating systems, depending on the size of the machine.

Ex-proof version is available. Among the other options available for special applications are: infinity variable speeds, two speed drives, hydraulic drive units, heating/cooling jacket, vacuum/pressurized operation, etc.

PDM Mixer with double jacket

Double Planetary Mixer

SPECIAL DESIGNS:

PerMix designs the **Double Planetary Mixer** according to the special requirements and applications of the customer. Some modifications include:

- For mixed products that must be heated or cooled, PerMix has designed jacketed vessels for hot oil, electrical heating, steam heating and liquid cooling.
- PerMix has designed moveable and tiltable mixing vessels, with or without a bottom discharge valve for less viscous liquids and units with a special no dead area valve for connection to peripheral equipment. Arrangements can be made for the transport of the vessel by forklift or by crane.
- Different shapes of mixing tools are available; a third mixing tool may be added; a homogenizer unit (with deflector) can be supplied.
- The PerMix **DISSOLVER UNIT** for fine dispersion, with its own drive unit, available with or without variable speed, has proven itself a good process accelerator for dealing with special dispersions.

PDM Mixer with moveable tank, and additional DISSOLVER UNIT mixing tool

SPECIFICATION TABLE:

Model	Total volume (liter)	Working volume (liter)	Motor (kW)	Lifting power (kW)	Length (mm)	Width (mm)	Height [*closed*] (mm)	Height [*open*] (mm)
PDP-3	3.5	2	0.75	-	950	500	1,500	-
PDP-10	10	6	1.5	-	1,000	500	1,650	-
PDP-30	30	20	4	1.1	1,250	700	1,350	1,750
PDP-50	50	35	5.5	1.1	1,300	800	1,450	1,900
PDP-100	100	70	7.5	1.5	1,550	700	1,450	1,950
PDP-200	200	140	11	2.2	1,850	800	1,700	2,300
PDP-300	300	210	15	2.2	1,900	900	1,700	2,350
PDP-500	500	350	30	4	2,400	1,050	2,000	2,800
PDP-750	750	520	37	4	2,750	1,200	2,400	3,300
PDP-1000	1,000	700	45	5.5	2,800	1,650	2,450	3,300

1) All specifications are as accurate as is reasonably possible, but they are not binding.
2) Customized sizes are available against request.
3) PerMix reserves the right to modify the design without notice.

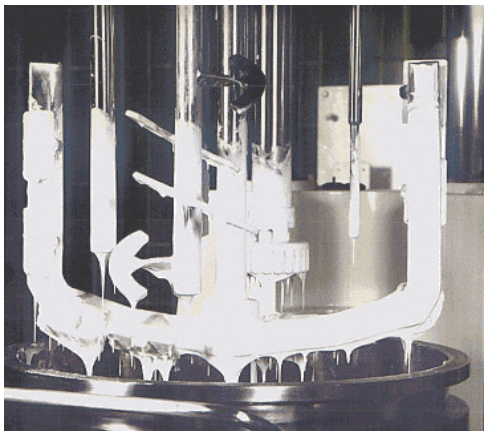
Multi-shaft Vacuum Mixer

INTRODUCTION:

The PerMix **PMS series Multi-shaft Vacuum Mixer** is a revolutionary universal multiple processing mixer which is designed to serve a wide variety of industries in many different processes. PerMix **PMS series Multi-shaft Vacuum Mixer** provides a unique three-way mixing action by combining slowly running elements with a rapidly running element.

The PerMix **PMS series Multi-shaft Vacuum Mixer** therefore is not limited to the simple production of emulsions, suspensions and other homogenous products, but covers the entire manufacturing process: from feeding the components, to the well-deaerated and ready-for-packaging product.

HOW IT WORKS:



Multiple Shaft Mixer with different mixing tools

During operation of the PerMix **PMS series Multi-shaft Vacuum Mixer**, the high speed blade provides high shear to disperse the materials, while the low speed blade keeps feeding the high speed blade by scraping material mass from near the wall.

The PerMix **PMS Vacuum Mixer** is distinguished among the mixing family due to the innovative idea to combine different mixing elements, which provides the following advantages:

- An increased grinding, dispersion and emulsification of fineness
- A stable, homogenous end-product with excellent granule distribution
- Extremely short production cycles
- The option of producing cold emulsions with installation of the PerMix Stator/Rotor High Shear Mixing Element leading to considerable energy savings

VACUUM DEAERATION:

The intensive action produced by the different mixing elements in **PMS Vacuum Mixer** ensures not only a thorough mixing of the product but also exposes it to the vacuum prevailing in the vessel. The air bubbles in the product being mixed continually rise to the surface, burst under the effect of the vacuum and exit through the vacuum pump. This ongoing deaeration process increases the chemical stability of the product and prevents unwanted chemical reactions such as oxidation, ensures greater measuring precision on the part of the filling machines, accelerates emulsion formation, and produces a pleasant, smooth and shiny end product.

Multi-shaft Vacuum Mixer

HYGIENIC DESIGN UNDER GMP RULES:

The PerMix **PMS series Multi-shaft Mixer** is manufactured in accordance with the Good Manufacturing Practice (GMP) rules. There are no blind corners in the unit to eliminate any possible residue. All parts that come in contact with the product are made of stainless steel, and they are easily accessible and removable. The whole unit or any of its parts may be sterilized by steam.

HEATING & COOLING JACKET:

The double jacket has connections for water, steam or thermal oil. Facilities for permissible operational pressure are included to purchaser specifications. The installed baffle plates between the vessel and jacket walls improve heat transfer and reduce the heating and cooling time. A complete and fully operational temperature control system which can be simply connected to power, water and steam is available at extra cost. The measuring instruments are supplied with each unit: thermometer, vacuum and pressure gauge.

SPECIFICATION TABLE:

Model	Total volume, liter	Working volume, liter	Emulsifying motor, kW	Scraper motor, kW	Lifting motor, kW	Length (mm)	Width (mm)	Height [*closed*] (mm)	Height [*open*] (mm)
PMS-10	13	10	0.37	0.37	-	1,050	450	1,000	-
PMS-20	25	20	0.37	0.55	-	1,070	650	1,250	-
PMS-50	70	50	0.75	0.75	0.75	1,300	720	1,550	2,000
PMS-100	125	100	1.5	1.5	0.75	1,500	1,200	1,600	2,100
PMS-150	180	150	2.2	2.2	0.75	1,650	1,250	1,650	2,300
PMS-200	230	200	4	3	1.1	1,700	1,300	1,650	2,350
PMS-300	350	300	5.5	4	1.1	1,850	1,350	1,650	2,450
PMS-500	580	500	7.5	5.5	1.1	2,200	1,600	1,900	2,800
PMS-750	900	750	11	7.5	1.5	2,400	1,650	2,200	3,400
PMS-1000	1,200	1,000	15	11	1.5	2,600	1,800	2,500	3,700

1) All specifications are as accurate as is reasonably possible, but they are not binding.
2) Customized sizes are available against request.
3) PerMix reserves the right to modify the design without notice.

Vacuum Emulsifying Mixer

INTRODUCTION:

The PerMix **PVC series Vacuum Emulsifying Mixer** is a vacuum mixing, dispersing, homogenizing and emulsifying system that is used whenever a high quality and absolutely air-free product is required as with the PerMix **PMS series Vacuum Multi-shaft Mixer**, but at a lower cost.

The **PVC Vacuum Emulsifying Mixer** caters to various work processes which normally require more machinery in one system. In the **PVC Vacuum Emulsifying Mixer**, base materials can be mixed in liquids, dispersed and homogenized while at the same time all air is removed. This produces stable emulsions with a long shelf life in storage.

The **PVC Vacuum Emulsifying Mixer** is used extensively in the food, cosmetic, chemical and pharmaceutical industries, especially in production of mayonnaise, ketchup, dressings, etc.

ADVANTAGES & OPTIONS:

Multi-purpose working head of PVC Vacuum Emulsifying Mixer

The basis of **PVC Vacuum Emulsifying Mixer** is the innovative mixing, dispersing and homogenizing head with multi-working chambers. It can be supplied with mixing vanes, dispersion components or homogenizing tools. For each operation, these components can be interchanged or combined so that the mixer operates to suit every product possibility.

The pump action allows the product to circulate from the feed hoppers through the working hopper continuously. All the parts that come in contact with the product are stainless steel.

The following extras are available:

- Electrical elevation for the hopper cover
- Working hopper with double wall to provide either heating or cooling
- Mobile underframe

SPECIFICATION TABLE:

Model	Total volume, liter	Working volume, liter	Emulsifying motor, kW	Scraper motor, kW	Length (mm)	Width (mm)	Height [*closed*] (mm)	Height [*open*] (mm)
PVC-8	10	8	1.1	0.25	-	-	-	-
PVC-50	70	50	2.2	0.37	-	-	-	-
PVC-100	125	100	5.5	0.55	870	650	1,300	1,710
PVC-150	180	150	5.5	0.55	950	720	1,450	1,990
PVC-300	350	300	7.5	0.75	1,260	930	1,850	2,610
PVC-500	580	500	11	1.1	1,500	1,100	2,180	3,160
PVC-1000	1,200	1,000	22	2.2	2,040	1,390	2,750	3,660

1) All specifications are as accurate as is reasonably possible, but they are not binding.
2) Customized sizes are available against request.
3) PerMix reserves the right to modify the design without notice.

High Speed Disperser

INTRODUCTION:

The PerMix **PD series High Speed Disperser** (or **Dissolver**) is ideally designed to meet the demands of a broad spectrum of industrial applications for dispersing purpose of solid or liquid materials into liquid body.

PD series High Speed Disperser works with the powerful high speed rotation of the saw disc impeller. Liquid or solid materials are subject to the high shear force at the periphery of the saw disc when the impeller is rotating at high speed, and they are dispersed quickly and efficiently into the liquid body, after short time, homogenous dispersion is produced.

The ease of operation and high efficiency of **PerMix High Speed Dispersers** reduce cost and operation time, and have proven themselves by providing the most economical solutions to a variety of dispersing problems.

Disperser with movable tanks

DESIGN FEATURES:

Except the standard features of PerMix **High Speed Disperser** such as drum clamping arms, hydraulic lifting station, complete safety switches, variable speed controlling, PerMix can also customize accessories to meet your specific needs, those options including but not limited to:

- Swiveling head which can serve several stationary drums
- Quick locking vacuum cover which allows easy dismantling
- Adjustable safety cover which protects against splashing and dust
- Impeller system with a static toothed ring for very high shearing forces
- Mixing cans with trolley
- Double-jacketed mixing drums
- Individually driven scrapers

SPECIAL DESIGNS:

PerMix distinguish ourselves from other suppliers with the capability to provide our **PD series High Speed Dispersers** with designs for some specific purposes:

PerMix **Lab-size High Speed Disperser** (Dissolver) is used for R&D purposes by performing each of the previously mentioned functions.

PerMix **VACUUM High Speed Disperser** (Dissolver) produces an intense motion which rapidly removes air or gases from the product. The built-in vacuum cover lifting device enables the customers to adjust the dissolver disc height without breaking the vacuum.

Lab-size High Speed Disperser

High Speed Disperser

PerMix **TWIN-SHAFT High Speed Disperser** (Dissolver): the exclusive combination of a slow running element with a high speed dissolver disc enables you to produce batches of excellent quality and uniformity, which are twice as large as those produced in a conventional system. This mixer can handle high viscosity products (up to 600,000 cPs) or large quantities of solids.

A vacuum version of the PerMix **TWIN-SHAFT High Speed Disperser** (Dissolver) is also available as well as different types of slow running elements.

PerMix **WALL-MOUNTED High Speed Disperser** (Dissolver) is a practical and economical way to produce small and medium sized batches. A counterweight helps elevate the mixer, which can then be locked in any desired position. As an option, the elevating system can be manually, electro-mechanically or hydraulically controlled.

Twin-shaft Disperser

APPLICATIONS:

The most popular and common applications of the PerMix **High Speed Dispersers** are as following:

- **General:** Dispersing, suspending, emulsifying, dissolving, homogenizing, mixing and breaking down agglomerates of high viscous materials (up to 300,000 cPs)
- **Paints, varnishes and printing inks:** Preparing paint batches, carbon paper paint, artist's paints, priming and rust removing paints, fillers, dispersion and coating paints, varnish pastes, printing inks, resin solutions, textile printing inks, etc
- **Plastics:** Preparing all types of PVC, PU pastes, color concentrates and plastic putties
- **Adhesives:** Preparing rubber, neoprene, resin and other types of adhesives
- **Chemicals:** Preparing filler dispersions, coating materials, insulation materials, bitumen based sealing materials, greases and lubricants

SPECIFICATION TABLE:

Model	Working Volume (liter)	Main Motor (kW)	Max. Shaft Speed (rpm)	Overall Dimension					Weight (kg)
				L (mm)	W (mm)	H (mm)	H (lifted) (mm)	Disc Dia. (mm)	
PD-5L *	2-5	0.55	0-10,000	460	420	740	990	50/60	30
PD-70 *	70	1.5/2.2	2,100	680	775	1410	1910	120/100	140
PD-100	100	3	2,100	950	400	1500	2100	150/100	200
PD-200	200	5.5	2,100	1400	700	1750	2550	200/150	500
PD-300	300	7.5	2,100	2200	1100	2100	3100	250/200	1200
PD-500	500	11	1,500	2200	1100	2100	3100	300/250	1300
PD-700	700	18.5	1,500	2400	1300	2200	3300	350/300	1400
PD-1000	1000	22	1,500	2500	1400	2200	3300	400/300	1600
PD-1200	1200	30	1,500	2800	1600	2500	3700	425/350	1900
PD-2000	2000	37	1,500	2800	1600	2500	3700	500/425	2100
PD-3000	3000	55	1,500	3400	2200	3000	4500	625/500	2400
PD-4000	4000	75	1,000	3400	2200	3000	4500	700/625	2600
PD-6000	6000	110	1,000	3800	2400	3200	4800	800/700	3100

1) Dimension/Weight information of PD-5L/PD-70 includes the manual lifting stand.
2) Specific working volumes can be offered according to customer's requirement.
3) All specifications and illustrations are as accurate as is reasonably possible, but they are not binding.
4) PerMix reserves the right to modify the design without notice.

High Shear Emulsifier Mixer

INTRODUCTION:

PerMix **PS series High Shear Emulsifier Mixers** present a solution for dispersing one or several solid, liquid phase into another continuous liquid phase in a fast and efficient way, while the phases are normally immiscible.

Unlike conventional mixing, **PS Mixer** is structured with an innovative stator-rotor. This special design makes **PS Mixer** not only simply mix, but also disperse, suspend, emulsify, homogenize and disintegrate liquid and solid. PerMix **PS Mixers** are used to handle a wide range of products in the food-processing, cosmetics, pharmaceutical and fine chemistry industries.

HOW IT WORKS:

There are four steps to explain the working principle:

(Step 1/4)

(Step 2/4)

Step 1. When the rotor of **PS Mixer** is driven by the motor, it rotates at a very high speed of several thousands rpm (usually 3,000rpm @50Hz). A powerful suction is generated at the center of the rotor which draws both solids and liquids from the bottom of the tank into the central zone of the stator/rotor system.

Step 2. Centrifugal force leads the materials to the periphery. Materials are subjected to intensive squeezing and milling at the precision machined clearance between rotor and stator. High pressure is created there too due to the gathering of materials, which makes the impact between particles more remarkable.

Step 3. Followed is another intense hydraulic shear as the materials are forced out through the openings in the stator at very high velocity. When material particles arrive outside of the stator, they tend to explode into thousands of even smaller ones as the pressure drops down sharply.

Step 4. Fresh materials are continually drawn into the stator-rotor maintaining the mixing cycle. Due to the vortex in the tank, materials in every corner of the tank can pass through the stator-rotor system again and again, resulting in fine droplet size.

(Step 3/4)

(Step 4/4)

High Shear Emulsifier Mixer

STATOR/ROTOR SYSTEM:

We offer two types of Stator & Rotor systems: V and K, and both have several sub-types. The reason to have so many designs of stator & rotor systems is to offer more selections for our customers to choose the most suitable one to deal with their specific liquids and solids.

V-type Stator/Rotor

K-type Stator/Rotor

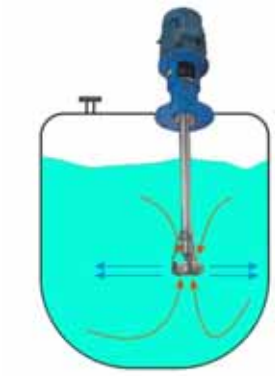
INSTALLATION & SPECIFICATIONS:

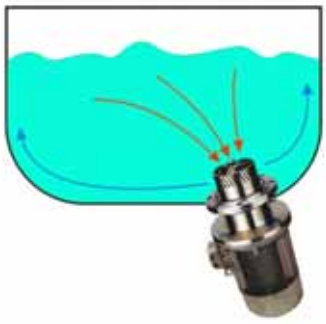
- Top Entry Mixer / PS-D, PS-C, PS-M

PerMix offers two kinds of Top Entry Mixers - one is working in an open vessel, and the other is working in an closed (pressurized and vacuum) vessel.

An open vessel is a vessel with normal pressure. The top entry mixers can be installed onto a lifting stand or directly onto the vessel by a flange or traverse (PS-D). A coupling between the motor and shaft is optional for low noise and stable running (PS-C).

A closed vessel is a vessel with vacuum or pressure in it. In this case, the top entry mixers must be equipped with a mechanical seal, which enables that there is no air transportation between inside and outside of the vessel (PS-M).





- Bottom Entry Mixer / PS-B

The bottom entry mixers are outstanding in many cases:

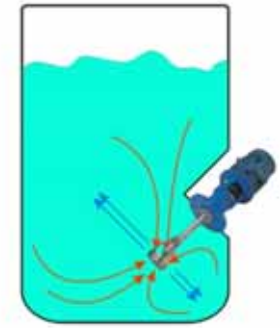
- When the liquid level in the tank may become very low during processing, top or side entry mixer is not able to work without contacting liquid body.
- There is very limited space above or around the tank for either top or side mounted ones.
- Strong vortex as well as aeration is greatly reduced with the PerMix bottom entry mixers.

- Side Entry Mixer / PS-S

The side entry mixer is very useful when the tank is deep but narrow, or when the top space of the vessel is limited for the top entry ones, and bottom space is not sufficient for a bottom entry one.

A side entry mixer is much more cost effective compared with the top entry mixer, because it makes the shaft shorter. The longer the shaft is, the more difficult for fabrication, hence the cost rises sharply.

Side entry mixer is designed according to specific tank size.



High Shear Emulsifier Mixer

Top Entry Mixer:

Model	Watts, kW	RPM, @50Hz	Max. Capacity, L		Shaft Length, mm
			@1 cPs	@3,000 cPs	
PS-X/080	1.5	3000	50	20	350
PS-X/100	2.2		100	50	600
PS-X/120	4		300	150	700
PS-X/140	7.5		800	500	800
PS-X/160	11		1500	750	820
PS-X/180	18.5		2000	1000	1100
PS-X/200	22	1500	4000	2000	1150
PS-X/220	30		5000	2500	1200
PS-X/240	37		6500	3200	1300
PS-X/270	55		10000	5000	1500
PS-X/290	75		12000	6000	1550
PS-X/300	90		15000	7500	1600

1) PS-C, PS-D, PS-M share the same specifications.
2) Actual liquid capacity will vary depending on the liquid type and different stator rotor system.
3) PerMix offers bigger capacity according to customer requests.
4) PerMix reserves the right to modify the design without notice.

Bottom Entry Mixer:

Model	Watts, kW	RPM, @50Hz	Max. Capacity, L		Shaft Length, mm
			@1 cPs	@3,000 cPs	
PS-B/80	1.5	3000	50	20	80
PS-B/100	2.2		100	50	100
PS-B/120	4		300	150	150
PS-B/140	7.5		1000	500	150
PS-B/160	11		1500	750	150
PS-B/180	18.5		2000	1000	180
PS-B/200	22		4000	2000	180
PS-B/220	30		5000	2500	190
PS-B/240	37	1500	6500	3200	200
PS-B/270	55		10000	5000	210
PS-B/290	75		12000	6000	210

1) Actual liquid capacity will vary depending on the liquid type and different stator rotor system.
2) PerMix offers bigger capacity according to customer requests.
3) PerMix reserves the right to modify the design without notice.

Inline Emulsifier Mixer

INTRODUCTION:

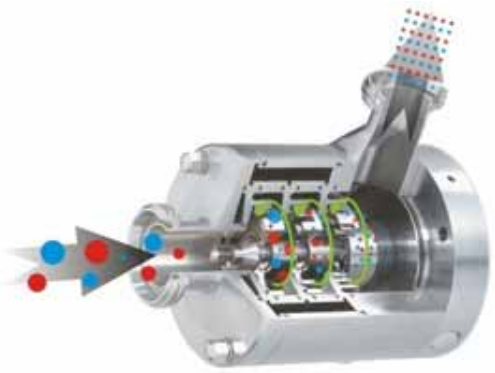
PerMix **PC series Inline Emulsifier Mixer** (which is also called **Inline High Shear Mixer**) is applied for the mixing, dispersing and homogenizing of solid & liquid, liquid & liquid in a circulating or continuous way.

Different from a **Batch High Shear Mixer**, the mixing occurs in the mixing chamber, thus energy is introduced onto materials in the most efficient way. This also cuts the process times by up to 90% compared with conventional blending methods.

HOW IT WORKS:

Same as **PS series High Shear Mixers**, there are also four steps to explain the working principle of the **PC series Inline Emulsifier Mixers**:

Step 1. When the rotor is driven by the motor, it rotates at a very high speed of several thousands rpm. A powerful suction is generated at its center and draws both solids and liquids from the inlet pipe into the working chamber.



Step 2. Centrifugal force leads the materials to the periphery. Materials are subjected to intensive squeezing and milling at the precision machined clearance between rotor and stator. High pressure is created there too due to the gathering of materials, which makes the impact between particles more remarkable.

Step 3. Followed is another intense hydraulic shear as the materials are forced out through the openings in the stator at very high velocity. When material particles arrive outside of the stator, they tend to explode into thousands of even smaller ones as the pressure drops down sharply.

Step 4. Fresh materials are continually drawn into the stator-rotor maintaining the circulation or single-pass flow.

STATOR/ROTOR SYSTEM:

PerMix also designs two types of **Stator & Rotor** systems: V type and K type. Both types have several sub-types to deal with different applications. These designs of stator & rotor systems provide more selections for our customers to choose for the most suitable one to deal with the specific liquids and solids.

K-type

V-type

Inline Emulsifier Mixer

MULTI-ROW & MULTI-STAGE:

- Rows: Every stator and every rotor have one or several rows of "teeth" (K-type, stator and rotor), or "blades" (V-type, rotor), or "screens" (V-type, stator).

- Stages: PerMix supplies PC-1 series Single-stage Inline Mixer, and PC-3 series Multi-stage Inline Mixer. PC-3 series Inline Mixers have three sets of stator & rotor. Standard PC-3 Mixer includes sets of coarse, intermediate and fine stator & rotor assemblies. PC-3 Series Inline Mixer is applied to deal with difficult-to-disperse materials, or when customers require single-pass processing.

FEATURES & OPTIONS:

- High speed, belt driven mixer

PerMix standard inline mixer has its shaft connected directly to the motor, thus limits its speed to 3,000rpm @50Hz. In order to achieve multiple rpm to offer more intensive shear force, PerMix designs the high speed, belt driven mixer. It reaches the max. 12,000rpm with a tip speed up to 40m/s.

- Double mechanical seals & Thermosyphon

The PerMix TS series Thermosyphon is used to store and cool the buffer liquid for the double mechanical seals, operated as a closed circuit. It is able to compensate the leakage of the buffer liquid at the double mechanical seals to avoid drying running of the seals, thus improve the performance and duty life of the seals.

Inline Mixer with thermosyphon to cooling the double mechanical shaft seals

Other options including but not limited to:

- Interchangeable stators
- A variety of inlet/outlet connection standard (ISO, DIN, etc)
- Mobile version with trolley
- Additional rotary lobe pump for viscous materials
- Contact part by SS304, SS316L and other metal materials
- Variable speed control
- Stator/rotor to be specially treated for corrosion or abrasion
- Motor shroud made by stainless steel

Inline Emulsifier Mixer

SPECIFICATION TABLE:

Single stage, PC-1:

Model	Watts, kW	RPM, @50Hz	Max. Capacity	Size [DN]	
			[L/hr] @ 1 cPs	Inlet	Outlet
PC-1/60K-Ultra	*4*	*7,500*	1,500	32	25
PC-1/80K	1.5	3,000	1,500	32	25
PC-1/100K	2.2		3,000	40	32
PC-1/120K	4		4,000	40	32
PC-1/140K	5.5		5,000	50	40
PC-1/165K	7.5		8,000	50	40
PC-1/180K	11		12,000	65	50
PC-1/185K	15		18,000	65	50
PC-1/200K	22		25,000	65	50
PC-1/210K	37		35,000	80	65
PC-1/230K	45		50,000	100	80
PC-1/245K	55		75,000	100	80
PC-1/260K	75		90,000	125	100
PC-1/280K	90		110,000	125	100
PC-1/290K	132		130,000	150	125

Three-stage, PC-3:

Model	Watts, kW	RPM, @50Hz	Max. Capacity	Size [DN]	
			[L/hr] @ 1 cPs	Inlet	Outlet
PC-3/80K	4	3,000	1,500	32	25
PC-3/100K	5.5		3,000	40	32
PC-3/120K	7.5		4,000	40	32
PC-3/140K	11		5,000	50	40
PC-3/165K	18.5		8,000	50	40
PC-3/180K	22		12,000	65	50
PC-3/185K	30		18,000	65	50
PC-3/200K	45		25,000	65	50
PC-3/210K	55	1,500	35,000	80	65
PC-3/230K	75		45,000	100	80
PC-3/245K	90		60,000	100	80
PC-3/260K	110		75,000	100	80
PC-3/280K	132		95,000	125	100

1. Actual liquid capacity will vary depending on the liquid type and different stator rotor system.
2. PerMix offers bigger capacity according to customer requests.
3. PerMix reserves the right to modify the design without notice.



Powder Liquid Mixer

INTRODUCTION:

The PerMix **PT-C Series Powder Liquid Mixers** are designed for mixing powder into liquid. By a selection of different rotating element, PT-C Powder Liquid Mixer is able to provide various functions of high volume powder induction, dispersing of "difficult-to-wet" powder, handling the fine dusty powders, homogenizing, emulsifying, etc.

With all its unique features, our **PT-C Powder Liquid Mixer** is widely used in mixing of all kinds of powder products by a variety of industries, e.g. food and beverage, dairy care, pharmaceutical, chemical.

HOW IT WORKS:

PerMix offers four types of Powder Liquid Mixer, covering the common product range in the market.

(1) PT-C/Q (Double Wall Design)

PerMix PT-C/Q powder liquid mixer is the most common type which is also called Tri-blender. It has two key parts, a casing pipe and a stator rotor high shear mixer. The casing pipe is built vertically and coaxially into the stator rotor system inlet. As the rotor running at high speed during operation, liquid enters into the chamber and a water ring is created. Vacuum is generated at the center which sucks the powder from the hopper above. A valve at the bottom of the hopper is used to regulate the falling rate of the powder. As soon as the powder gets in contact with the liquid, it is wetted and dispersed into the liquid by the turbulence and later high shear force when the mixture goes through the precise machined clearance between the stator and rotor, and radiated out through the stator openings.

(2) PT-C/Y (Special Stator Rotor)

PerMix PT-C/Y series Powder Liquid Mixer has a very specially designed stator/rotor, which works by the principle of a water ring pump, that is able to produce relatively high vacuum, and this vacuum makes the PT-C/Y mixer be able to suck the powder through a hand-held wand from a bag or other container at ground level; meanwhile, the high shear stator rotor will disperse the powder into the liquid immediately to eliminate any lumps or fish-eyes. Of course, the powder can also be incorporated from a vertical hopper by gravity at a much higher powder sucking rate.

(3) PT-C/F (Two Pumps Design)

The PT-C/F Powder Liquid Mixing System is designed with the combination of a self-priming pump and an inline homogenizing mixer. The self-priming pump draws the liquid from an external container, and when the liquid passes through a venturi pipe which is located at the bottom of a powder hopper, vacuum is generated there and sucks the powder from above. The powder/liquid mixture will first pass through the self-priming pump, and later get further sheared and dispersed at the inline homogenizing mixer.

(4) PCH (Shear Pump)

Please refer to the page of PCH Shear Pump (Page 40) for more information.

Shear Pump

INTRODUCTION:

PerMix **PCH series Shear Pump** combines the advantage of both a centrifugal pump and an inline high shear mixer. It achieves the balance of pumping efficiency and shearing energy. PerMix **PCH Shear Pump** has a pair of stator rotor, and the rotor is combined with a pumping impeller in the center and a toothed ring. By this design, the Shear Pump is able to keep a medium shearing performance while give a fairly large pumping capability. When a higher shearing is required, the customer can go for the PerMix **PC series Inline Emulsifying Mixer**. PerMix **PCH Shear Pump** is designed and built in all stainless steel, especially for hygienic applications, for example dairy, food, cosmetics and pharmaceutical industries.

FEATURES & OPTIONS:

PCH Shear Pump is ideal for diary, beverage, food and other hygienic applications, with the following features and options:

- Compact and streamlined design
- All built in stainless steel, with a stainless steel motor shroud
- Easy assembly and disassembly
- Free flow powder induction, high efficiency, free of lumps and fish-eyes
- 90% process time reduction compared with conventional agitator mixing
- CIP available
- Interchangeable stator rotor of various type for different purposes

By installing a hopper or a feeding table, the **PCH Shear Pump** is converted to a Powder Liquid Mixer, to be able to dissolve/disperse free flowing powder material into light liquid in a quite fast and efficient way. The Powder Liquid Mixer is built in all stainless steel; with single or double mechanical sealing to be selected according to different materials. The **PCH Shear Pump** can be easily cleaned with CIP (Clean In Place) system to save time and labor.

SPECIFICATION TABLE:

Model	Motor, kW	RPM, @50Hz	Max. Liquid Capacity, L/hr	Max. Powder Capacity, Kg/min	Size [DN]	
					Inlet	Outlet
PCH-100	3-4	3,000	5,000	3	40	32
PCH-130	5.5-7.5		10,000	10	50	40
PCH-160	11-18.5		20,000	18	65	50
PCH-190	22-30		30,000	32	65	50
PCH-210	30-37		40,000	50	80	65

1) Actual liquid/powder capacity will vary depending on the material characters and stator rotor type.
2) PerMix offers bigger capacity according to customer requests.
3) PerMix reserves the right to modify the design without notice.

Liquid Agitator

INTRODUCTION:

PerMix designs and manufactures a comprehensive range of Liquid Agitators to suit every process requirement. Since our foundation, we have been providing agitators & mixing systems for customers all over the world, using cutting edge mixing and process technology, serving a broad range of industries.

In some cases, only one agitator with a single impeller would do the job well, but complicated condition also asks for several agitators with more than one impeller on each agitator to work together. Because there are so many choices of impellers available, it is always a big challenge for the users to choose the right impellers and their combinations in order to get the best solution. PerMix is always ready to face the big challenge with our years of experience.

DESIGN FEATURES:

We offer a lot of impeller types for agitators:

- Anchor
Laminar flow, high viscosity between 5,000 and 100,000 cPs

- Gate
Laminar flow, high viscosity between 5,000 and 100,000 cPs

- Helical ribbon
Axial movement of the liquid; suitable for very high viscosity up to 25,000,000 cPs

- Hydrofoil
High efficiency impeller, excellent pumping ability with a strong axial flow, for moderate viscosity mixing up to 10,000 cPs

- Marine propeller
Most common type of mixing impeller, most effective axial flow, used at high speeds (750-3,000rpm) with low viscosity less than 4,000 cPs

- Pitch blade (Turbine)
Combined axial and radial flows, especially effective for heat exchange, for moderate viscosity mixing up to 10,000 cPs

- Rushton
Radial flow impeller; for low to medium viscosity fluids, generating strong top-to-bottom flows with suitable baffles

- UZ
Suitable for low to medium viscosity, used widely in food, beverage and dairy industries

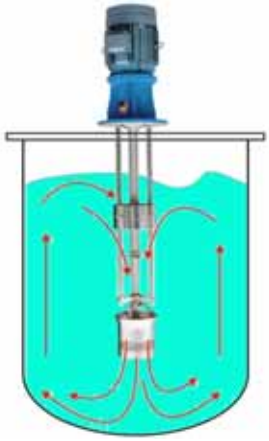
Jet Agitator & Disperser

INTRODUCTION:

PerMix **PJ series Jet Agiator & Disperser (**or **Jet Mixer)** is applied when a conventional blender is not enough but a high shear mixer will destroy the product nature.

It is distinguished over ordinary blenders due to its very innovative Stator & Rotor assembly. Stator is a streamlined deflector tube fixed around the three-blade rotor. This design draws the liquid & solid into the tube and generates great turbulence there to mix and disperse those “Difficult-To-Disperse” powders into liquids, more cost-effective, and cutting process time up to 90%.

HOW IT WORKS:



Step 1. When the rotor runs at high speed (up to 3,000rpm @ 50Hz), strong vacuum is generated at its center. Liquid & solid above are drawn into the tube with the guidance of the deflector (stator).

Step 2. Centrifugal force leads the materials to the periphery. Liquids and solids are subject to intensive squeezing and milling at the precision-machined clearance between stator and rotor.

Step 3. For N agitator, materials are expelled out from the bottom of the tube back to the liquid body. For O agitator, a part of them will stand another intense hydraulic shear as they pass through the openings in the stator.

Step 4. Fresh materials are continually drawn into the stator and rotor to maintain the mixing cycle in the tank.

STATOR/ROTOR DESIGN:

PerMix designs two different types of **Jet Mixer**: N type and O type.

Difference lies in the stator: N-type has no openings in the stator, but O-type has. N-type works mainly to mix and disperse solid into liquid without offering too much shear force, and O-type is able to generate much more shearing action onto the materials.

N type agitator is mainly used to provide a macro stirring to the liquid body with minimum energy consumption, while the O type disperser is used to disperse Difficult-to-Wet powder, such as dextrin, Xanthan, CMC.

Jet Agitator & Disperser

ADVANTAGES:

- Power efficiency to reduce energy consumption
With the innovative design of the deflector stator, **PJ Jet Mixer** is able to draw big volume of liquid body with very low power consumption, compared with traditional liquid agitator and high shear mixer.

- Free of floating agglomerates and sedimentation
The mixer draws the floating powder from the surface, and directs liquid towards the bottom of the vessel.

- Minimum aeration of air into the product
With **PJ series Jet Mixer**, there is minimum turbulence and vortex generated at the liquid surface thus avoiding air introduction.

Inside view of Jet Disperser (O type) in a tank

SPECIFICATION TABLE:

N type, Jet Agitator:

Model	Watts, kW	RPM, @50Hz	Max. Capacity, L		Shaft Length, mm
			@1 cPs	@3,000 cPs	
PJ-C/080-N	1.1-1.5	3,000	1,500	500	400-1,000
PJ-C/110-N	2.2-3		3,000	1,000	750-1,500
PJ-C/145-N	4-5.5		5,000	1,700	900-1,700
PJ-C/215-N	7.5-11	1,500	10,000	3,300	1,200-2,300
PJ-C/245-N	15-18.5		18,000	6,000	1,200-2,300
PJ-C/275-N	22-30		30,000	10,000	1,400-2,500
PJ-C/345-N	37-55		50,000	17,000	1,500-2,700

O type, Jet Disperser:

Model	Watts, kW	RPM, @50Hz	Max. Capacity, L		Shaft Length, mm
			@1 cPs	@3,000 cPs	
PJ-C/080-O	1.5-3	3,000	100	50	350
PJ-C/100-O	2.2-4		300	150	600
PJ-C/120-O	4-7.5		800	400	700
PJ-C/140-O	7.5-15		2,000	1,000	800
PJ-C/160-O	11-18.5		3,000	1,500	820
PJ-C/180-O	18.5-30		4,000	2,000	1,100
PJ-C/200-O	22-37	1,500	5,000	2,500	1,150
PJ-C/220-O	30-45		7,000	3,500	1,200
PJ-C/240-O	37-55		12,000	6,000	1,300

1) Actual liquid capacity will vary depending on the liquid type and viscosity.
2) PerMix offers customized capacity according to customer requests.
3) PerMix reserves the right to modify the design without notice.

Contra Rotating Mixer

INTRODUCTION:

PerMix **PCR series Contra Rotating Mixers** are typically used when thick emulsions are produced by a bottom entry high shear emulsifier or homogenizer. They are also very useful for multi task vessels where different process duties are required. PerMix **PCR Mixer** is fitted with two drives: an anchor / scraper drive and a centrally mounted turbine drive. In effect it is two mixers joined together.

ADVANTAGES & FEATURES:

PerMix **PCR series Contra Rotating Mixers** have the advantage to combine the benefits of a turbine unit along with that of an anchor / scraper. They offer excellent mixing throughout the vessel as viscosities increase due to their double mix system. The wet end of PerMix **PCR Mixers** can be complete and installed into the tank prior to the vessel being completed or can be fully split to allow simple installation / removal.

Magnetic Agitator

INTRODUCTION:

The range of PerMix **PM series Magnetic Agitators** uses special driving and sealing technology, which is totally different from the common gear-drive agitators. In a magnetic agitator, the magnetic couplings transmit their torque without direct touch of the mixing head, but by the magnetic field, thus they are working nearly without mechanical wear with much longer duty life with correct design and under proper working conditions. The mixing head can be equipped with several different mixing elements such as propellers or Rushton turbines.

ADVANTAGES:

- Highly hygienic design, easy cleaning and sterilization in the vessel by steam or hot water
- No sealing demand and no danger of leakage and contamination between batches
- Bayonet / Tri-clamp connection for easy assembly/disassembly of the drive unit (Option)
- Low shearing for shear-sensitive materials
- No wear of the mechanical parts leading to long duty life and minimum maintenance

SPECIFICATIONS:

Model	Max. Capacity, Liter	Motor Power, kW	Impeller Diameter	Speed, rpm
PM-90	50	0.12	90	362
PM-120	300	0.37	120	362
PM-155	500	0.55	155	362
PM-200	1,000	0.75	200	362
PM-220	3,000	1.5	220	362
PM-240	4,000	2.2	240	362
PM-260	6,000	3	260	362
PM-320	12,000	4	320	362

1) All specifications are as accurate as is reasonably possible, but they are not binding.

2) PerMix reserves the right to modify the design without notice.

Vacuum Deaerator

INTRODUCTION:

The PerMix **PDA series Vacuum Deaerator** is a totally compact sanitary device designed for the continuous automatic removal of air or other occluded gases from any type of liquid or paste, by means of vacuum. Processing of liquid products often incorporates air and unwanted gases into the product. These gases normally cause problems such as oxidation, discoloration, inconsistency, bad smell and filling difficulties.

HOW IT WORKS:

The PerMix **PDA series Vacuum Deaerator** operating principle comprises the formation of a fine layer of product, distributed in a thin layer on a centrifugal disc with a sieve. It is then sprinkled by a screening frame into a vacuum chamber. As a result of the vacuum effect, the air bubbles are burst and the deaerated product is discharged through the lower part by a positive displacement Mono or other type of pump.

APPLICATIONS:

The PerMix **PDA series Vacuum Deaerator** can handle numerous processes including (but not limited) the manufacture of food products, cosmetics and chemicals amongst others, need to avoid air oxidation to ensure a correct preservation or application. End products can be mentioned, such as sauces, fruit pulp, cosmetic creams, syrups, PVC dispersions, lubricants, car polish, shower gels, paraffin and penicillin emulsions, ice creams, adhesives, etc.

AVAILABLE OPTIONS:

- Fully automated for "stand alone" operation
- Speed of distributor plate infinitely adjustable
- Special level control for sensitive products
- Various vacuum systems available
- Higher pressure discharge pump
- Jacket for heating or cooling
- Portable design/on casters

SPECIFICATION TABLE:

Model	Working Volume (liter)	Max. Flow-rate (Liter/hr)			Total power (kW) (*)	L (mm)	W (mm)	H (mm)	H1, with open lid (mm)	Weight (kg)
		light liquid (<300cPs)	viscous product (<5,000cPs)	highly viscous product (≥5,000cPs)						
PDA-25	25	1,500	900	300	2.6	1,640	550	1,650	1,750	470
PDA-65	65	4,000	2,500	800	5.2	1,855	715	1,780	2,200	690
PDA-125	125	8,000	5,000	1,600	8.9	2,165	850	2,170	2,500	920
PDA-300	300	15,000	9,000	3,000	16.7	2,455	1,080	2,590	3,000	1,300
PDA-550	550	20,000	12,500	4,000	28	2,845	1,225	2,865	3,300	1,550
PDA-1200	1,200	30,000	18,000	6,000	40.5	3,455	1,850	3,675	4,180	2,180

1) Total power (kW) (*) includes all the motors of the machine, e.g. distribution disc, vacuum pump, discharge pump, etc.
2) All specifications and illustrations are as accurate as is reasonably possible, but they are not binding.
3) PerMix reserves the right to modify the design without notice.

Questionnaire

1) Powder Blending & Drying / 2) Paste Mixing & Kneading

Solid components:				
Proportion (%)				
Bulk density (kg/L)				
Size min. (mm)				
Size max. (mm)				
Moisture (%)				
Property	Good flowability ☐	Dry ☐	Moist ☐	Dusty ☐
Sticky ☐	Bridging ☐	Abrasive ☐	Corrosive ☐	Other ( )

Liquid components:			
Proportion (%)			
Density (kg/L)			
Viscosity (cP @20℃)			

Final product properties:		**Process description:**	
Powder ☐	Granulate ☐	Mixing ☐	Loosening ☐
Particle size (mm):		Wetting ☐	Granulating ☐
Free flowing ☐	Pasty ☐	Reaction ☐	Other ( )
Dusty: Heavy ☐; Light ☐; Not at all ☐		Heating/Cooling (℃):	

Method of operation:		Batch ☐	Continuous ☐
Manual ☐	Automatic ☐	Capacity (kg per batch, or kg/hour):	

General information:	Voltage/frequency:
Product contact parts: Mild steel ☐; SS304 ☐; SS316L ☐; Other ( )	Ex-proof class:

3) Liquid Dispersing & Mixing

Components (liquid or solid):			
Proportion (%)			
Density (kg/L)			
Viscosity (cP @20℃)			

Process description:	Dispersing ☐	Dissolving ☐	Emulsifying ☐
Homogenizing ☐	Depolymerizing ☐	Suspending ☐	Heat transferring ☐

Method of operation:		Batch ☐	Continuous ☐
Manual ☐	Automatic ☐	Capacity (Liter per batch, or Liter/hour):	

General information:	Voltage/frequency:
Product contact parts: Mild steel ☐; SS304 ☐; SS316L ☐; Other ( )	Ex-proof class:

Memo

PerMix
Perfect Mixing Technologies

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We offer Perfect Mixing Technologies!

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