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**PT-C POWDER LIQUID MIXER**

# PT-C POWDER LIQUID MIXER



The PerMix PT-C Series Powder Liquid Mixer is a family of equipment which are designed for mixing powder into liquid in an efficient way. 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.**

PerMix offers four (4) types of Powder Liquid Mixer, covering the common product range in the market:

- **PT-C/Q (Double Wall Design)**
- **PT-C/Y (Special Stator Rotor)**
- **PT-C/F (Two Pumps Design)**
- **PCH (Shear Pump)**

With its many distinguished features and options, PerMix PT-C Powder Liquid Mixers are widely used in mixing of almost all kinds of powdery products by a variety of industries, e.g. food and beverage, dairy care, pharmaceutical, chemical.

## HOW IT WORKS

The four types of powder liquid mixer share similar working principle, but with some difference:

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

The 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 system.

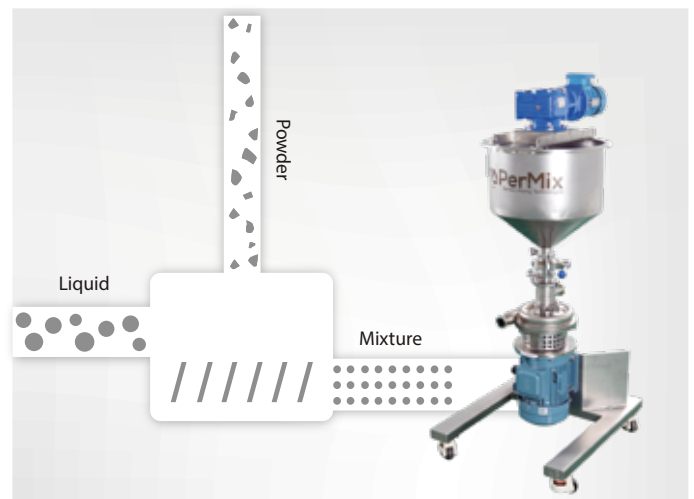
The casing pipe is built vertically and coaxially into the stator rotor system inlet. This double-wall design prevents the powder going through the casing pipe contacting the liquid and forming lumps before they both arrive at the stator rotor system.

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 causes suction of the powder from the hopper above the chamber.

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.

By choosing different types of stator rotor, it can provide various functions of powder wetting, homogenizing, etc. PerMix provides high shear stator/rotor, low shear stator/rotor; and in some cases where the powder is easily being dissolved into the liquid, only a regular centrifuge pump impeller is used without a stator, and it provides higher volume flowrate and bigger powder induction rate.



## 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; this vacuum makes the PT-C/Y mixer able to suck the powder through a hand-held wand from a bag or other container at ground level. The powder can also be incorporated from a vertical hopper by gravity at a much higher powder sucking rate.

## 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.

## PCH (Shear Pump)

By adding a hopper at the inlet of the liquid, our PCH shear pump can be converted to a powder liquid mixer, to provide perfectly good sucking performance for dry and free flowing powders, for example, milk powder, dry flour, etc. Due to the relatively simple and compact design and full stainless steel construction, the PCH is popular in many hygienic applications.

# APPLICATIONS

Some typical applications can be:

- Preparation of syrup, sorbitol, glucose, lactose, etc.
- Reconstitution of powdered milk, whey, protein, etc.
- Dissolution of CMC, Xanthan gum, etc
- Preparation of flour and starch slurries
- Preparation of brines
- Pre-mixtures of yogurt and other milk-based desserts
- Suspension of bentonites, TiO<sub>2</sub> in pigment
- Preparation of pesticides and fertilizers

# OPTIONS

A lot of options are available for the PT-C Powder Liquid Mixer:

- Powder hand-held hose assembly
- Variable speed motor; Frequency converter
- Multi-row, multi-stage stator & rotor
- Metal part to be SS 316L or others
- Gasket sealing of FPM, FFPM, etc.
- Hopper of 50°, 60°, etc.
- Hopper vibrator or Air sweeper
- Single or double mechanical seals

# SPECIFICATIONS

## (1.1) PT-C/Q-HS (Double Wall Design), w/ High Shear Stator/Rotor

Model	Watts, kW	RPM, @50Hz	Max. Liquid Capacity, Ton/hr	Max. Powder Capacity, Kg/min
PT-C/Q-80HS	1.5	3,000	1.5	5
PT-C/Q-100HS	2.2		3	10
PT-C/Q-120HS	4		4	15
PT-C/Q-140HS	5.5		5	20
PT-C/Q-165HS	7.5		8	30
PT-C/Q-180HS	11		12	50
PT-C/Q-185HS	15		18	80
PT-C/Q-200HS	22		25	120
PT-C/Q-210HS	37		35	180
PT-C/Q-230HS	45		40	220
PT-C/Q-245HS	55		50	250
PT-C/Q-260HS	75		75	300
PT-C/Q-280HS	90		90	400
PT-C/Q-290HS	132		110	500

- Actual liquid and powder capacity will vary depending on the material characters and stator rotor type.
- The machine is with one (1x) pair of stator rotor.
- PerMix offers special model according to customer requests.
- PerMix reserves the right to modify the design without notice.

## (1.2) PT-C/Q-LS (Double Wall Design), w/ Low Shear Stator/Rotor

Model	Watts, kW	RPM, @50Hz	Max. Liquid Capacity, Ton/hr	Powder Capacity, Kg/min
PT-C/Q-LS1	3	3,000	15	5~20
PT-C/Q-LS2	11	3,000	25	15~50
PT-C/Q-LS3	22	1,500	40	30~120

- Actual liquid and powder capacity will vary depending on the material characters.
- PerMix offers special model according to customer requests.
- PerMix reserves the right to modify the design without notice.

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

Model	Watts, kW	RPM, @50Hz	Max. Liquid Capacity, Ton/hr	Powder Capacity, Kg/min (with hand-held wand)
PT-C/Y-120	7.5~11	3,000	10	1~3
PT-C/Y-140	15~30		20	2~5
PT-C/Y-165	37~45		40	3~12
PT-C/Y-180	55~75	1,500	60	5~25
PT-C/Y-220	110~160		100	8~50

- Actual liquid and powder capacity will vary depending on the material characters and stator rotor type.
- PerMix offers special model according to customer requests.
- PerMix reserves the right to modify the design without notice.

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

Model	Mixer, kW	RPM, @50Hz	Self-priming Pump, kW	Pump RPM, @50Hz	Max. Liquid Capacity, Ton/hr	Max. Powder Capacity, Kg/min
PT-C/F-120	4	3,000	1.5	1,500	4	15
PT-C/F-140	5.5	3,000	1.5		6	30
PT-C/F-165	7.5	3,000	4		8	50
PT-C/F-180	11	3,000	4		12	90
PT-C/F-200	22	3,000	5.5		25	140
PT-C/F-210	30	3,000	7.5		30	190

- Actual liquid and powder capacity will vary depending on the material characters and stator rotor type.
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