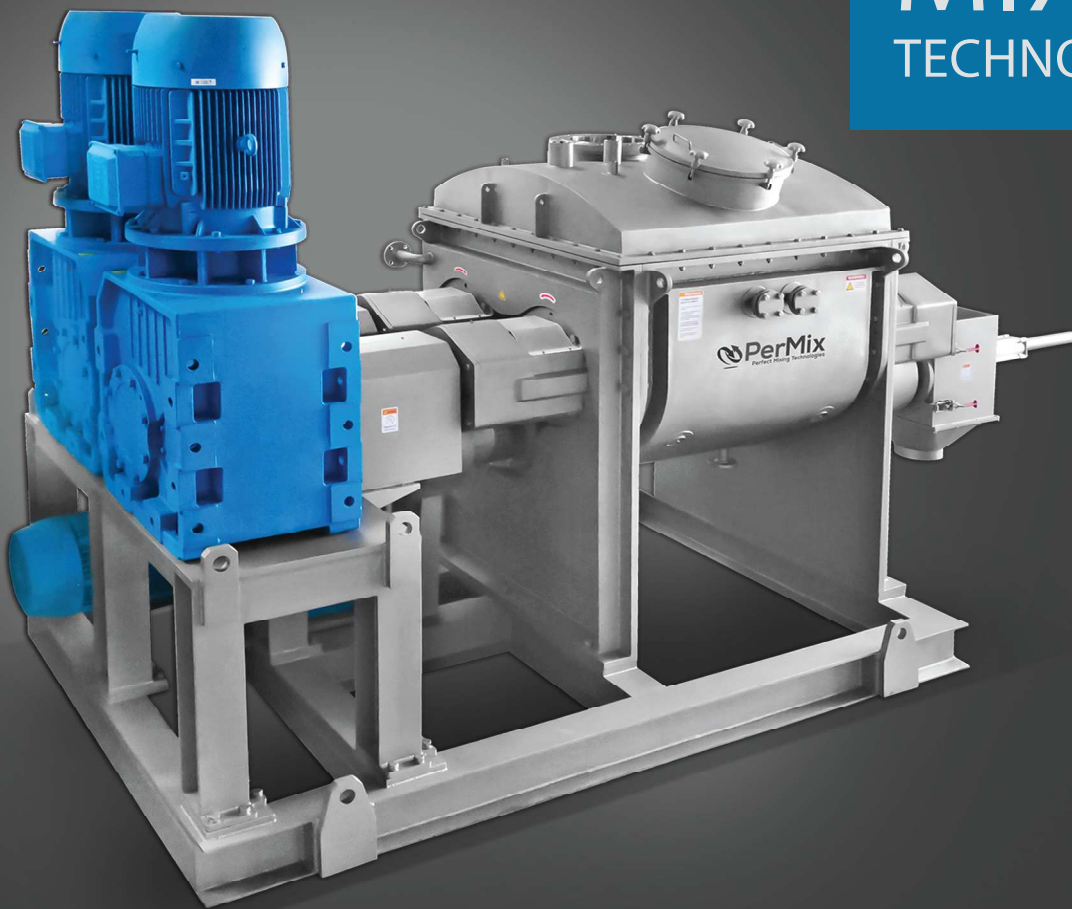


WE OFFER
PERFECT
MIXING
TECHNOLOGIES



PHARMACEUTICAL



NUTRACEUTICAL



FOOD



CHEMICAL



BIO



HEALTH & BEAUTY

PSG SIGMA MIXER | MIXTRUDER

PSG SIGMA MIXER & PSG-X MIXTRUDER

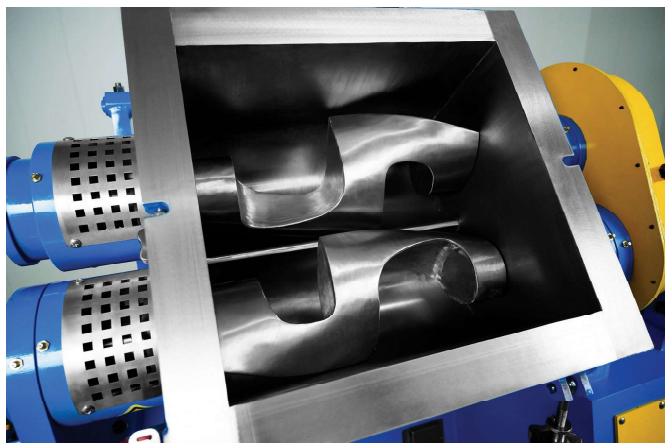
PerMix PSG series Sigma Mixer, which is also known as Double Sigma Mixer, or Double Z Blade Mixer, is used for the mixing-kneading of materials with very high viscosity (over 500,000 cps). If a screw extruder is applied for discharging, the mixer is also called Sigma Mixer Extruder, or Mixtruder.

With its unique design of Z-shaped mixing tools installed in two semi-cylinders, PSG Sigma 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

In the PerMix PSG series Sigma 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.

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.

DISCHARGE DESIGN

There are mainly three ways for discharging the product after mixing:

(1) Tilting Tank

For small machines (PSG-1 to PSG-15), tilting can be done manually with a mechanical type (handlever or handwheel). For greater machines, hydraulically powered tilting system is supplied. PerMix provides the feature that at tilted position, the blade will rotate at low speed (usually 20% of full speed) in reverse direction to aid the discharge by pushing two buttons with both hands.

(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. When the Sigma Mixer is with the discharge screw, we call it Sigma Mixtruder, and the model name is PSG-X. 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 drive so that blades and screw operate independently.

(3) Other Arrangement

Other discharging options are available against request, such as flush-fitting ball valves or sliding valves mounted at the trough bottom.

OPTIONS

The large number of options available for the PerMix PSG Sigma Mixer (Extruder) enable it to operate as a general purpose mixer or perform particular functions:

- **Quick Disassembly & Easy-clean Design**

With "easy-clean" design, the endplates, trough, cover, arms and screw can all be disassembled quickly without a tool for complete cleaning.

- **Lab-size for R&D**

Full volume of mixer can be 1L, 3L, 5L, 10L, 15L.

- **Overlapping Arms**

Overlapping arms provides more shearing to the product.

- **Vacuum Execution**

PerMix designs the Sigma Mixer (Extruder) to work under mild vacuum or high vacuum up to -0.95barg.

- **Welded Jacket for Heating & Cooling**

Jacket for heating/cooling by steam, thermal oil, or water can be welded around the trough and / or endplates. ASME/PED certificate is optional for high pressure operation.

- **Bored Arms for Heating & Cooling**

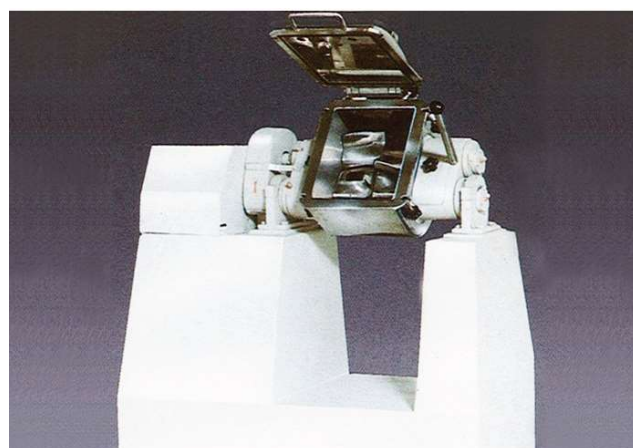
Arms, screw and main shafts can be designed with heating/cooling to offer more contact areas for heat exchange.



SPECIAL 'DUPLEX' ARMS

PerMix offers PSG-D series 'Duplex' Sigma 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.



SPECIFICATIONS

Sigma Mixer with Tilting Discharge (PSG)

Model	Total capacity (liter)	Working capacity (liter)	Power for Arms, kW (*) (high viscosity)	Power for Arms, kW (*) (very high viscosity)	Arm Speed, rpm (*)	Length (mm)	Width (mm)	Height (mm)
PSG-1	1	0.6	1.1	2.2	60/47	640	668	650
PSG-3	3	2	1.1	2.2	65/52	700	680	650
PSG-5	5	3.5	1.1	2.2	65/40	1,250	580	406
PSG-10	10	6	1.5	3	50/35	1,150	1,000	1,480
PSG-15	15	10	2.2	5.5	60/36	1,180	1,000	1,500
PSG-50	50	30	3-5.5	7.5-11	42/28	1,330	910	1,350
PSG-100	100	60	5.5-7.5	11-15	40/26	1,588	984	1,452
PSG-150	150	90	5.5-11	15-18.5	36/24	2,290	1,400	1,700
PSG-200	200	120	7.5-15	18.5-22	40/25	2,530	1,555	2,150
PSG-300	300	180	7.5-22	30-37	33/22	2,730	1,560	2,160
PSG-400	400	240	11-30	37-45	33/22	2,850	1,580	2,180
PSG-600	600	360	22-37	45-55	33/22	3,070	1,600	2,250
PSG-800	800	480	30-45	55-75	32/21	3,270	1,690	2,300
PSG-1000	1,000	600	37-55	75-110	32/21	3,440	1,790	2,400
PSG-1500	1,500	900	45-75	90-160	29/19	4,200	2,320	2,950
PSG-2000	2,000	1,200	55-90	110-160	29/19	4,800	2,800	3,100

- kW/rpm are product dependent and can vary a lot.
- Customized sizes are available against request.
- All specifications and illustrations are as accurate as is reasonably possible, but they are not binding.
- PerMix reserves the right to modify the design without notice.

SPECIFICATIONS

Mixtruder with Screw Discharge (PSG-X)

Model	Total capacity (liter)	Working capacity (liter)	Power for Arms, kW (*) (high viscosity)	Power for Arms, kW (*) (very high viscosity)	Arm Speed, rpm (*)	Power for Screw, kW (*) (high viscosity)	Power for Screw, kW (*) (very high viscosity)	Screw Speed, rpm (*)
PSG-1X	1	0.6	1.1	2.2	60/47	0.55	1.1	59
PSG-3X	3	2	1.1	2.2	60/47	0.55	1.1	59
PSG-5X	5	3.5	1.1	2.2	60/47	0.55	1.1	59
PSG-10X	10	6	1.5	3	60/42	0.55-0.75	1.1-1.5	60
PSG-15X	15	10	2.2-4	5.5	50/28	1.1	2.2	60
PSG-50X	50	30	3-5.5	7.5-11	43/27	1.5	3	58
PSG-100X	100	60	5.5-7.5	11-15	40/25	3	5.5	58
PSG-150X	150	90	5.5-11	15-18.5	40/25	3	7.5	57
PSG-200X	200	120	7.5-15	18.5-22	41/26	3	11	51
PSG-300X	300	180	7.5-22	30-37	33/22	4	15	51
PSG-400X	400	240	11-30	37-45	33/22	5.5	22	51
PSG-600X	600	360	22-37	45-55	35/23	11	30	53
PSG-800X	800	480	30-45	55-75	32/21	11	30	53
PSG-1000X	1,000	600	37-55	75-110	32/21	15	37	50
PSG-1500X	1,500	900	45-75	90-160	29/19	18.5	45	45
PSG-2000X	2,000	1,200	55-90.5	110-160	29/19	22	55	45

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Besides, PerMix have been building a network of agents located in Europe (Germany, Denmark, UK, Belgium, France, Spain, Poland, etc), Asia (South Korea, Indonesia, Thailand, Malaysia, Singapore), and several other countries.

