



PETROFORCE

Design, Engineering, Equipment Manufacturing,
Installation & Commissioning
Oil, Gas, Petrochemical Units & Mini Refineries

PETROFORCE Industrial Group
Pishgam Palayesh Force



Mixers Catalog

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About us

Pishgam Palayesh Force Company

This company was established as a subgroup of the Petroforce Industrial Holding. It has been involved in the design, modeling, technical calculations, procurement of equipment, construction, and commissioning of oil product manufacturing plants, as well as providing engineering services over 20 years.



Since one of the subgroups of the Petroforce industrial holding (Pishgam Saman Force) has experience in producing various lubricants, Pishgam Palayesh Force is familiar with the properties of raw materials and the requirements of their process and has also experienced numerous problems related to the dissolution and fragmentation of polymers founded in base oil.

Pishgam Palayesh Force has been a pioneer in the lubricant and motor oil industry across the country and the Middle East, by taking patterns and localizing the technology of Silverson company in designing and manufacturing High-shear mixers for the first time.

According to the importance of mixer equipment in the production process of various solvents, motor oils and industrial oils, the design and construction of various mixers, especially the high-shear mixers to polymer dissolution in base oil, put on the agenda of the technical and construction team of Pishgam Palayesh Force Company after lots of research and development.

Mixers

A mixer is an equipment that blends or homogenizes materials, or converts various fine materials into a single substance. Each mixer has a main chamber or tank in which the materials are mixed using an impeller. To mix different materials, several types of impellers and various heads are usually included with the mixer.

A special kind of Mixer is commonly used in the lubricant industry and the production process of various motor oils. These mixers are designed to crush, blend and homogenize of polymer in the oil without the risk of molecular breakdown of the polymer.

● Turbine Mixers

A type of process mixers is equipped with several types of impellers for mixing fluids with low and medium viscosity. A turbine consists of a circular disk to which several short blades are attached. The blades come in various types of flat, pitched and curved.

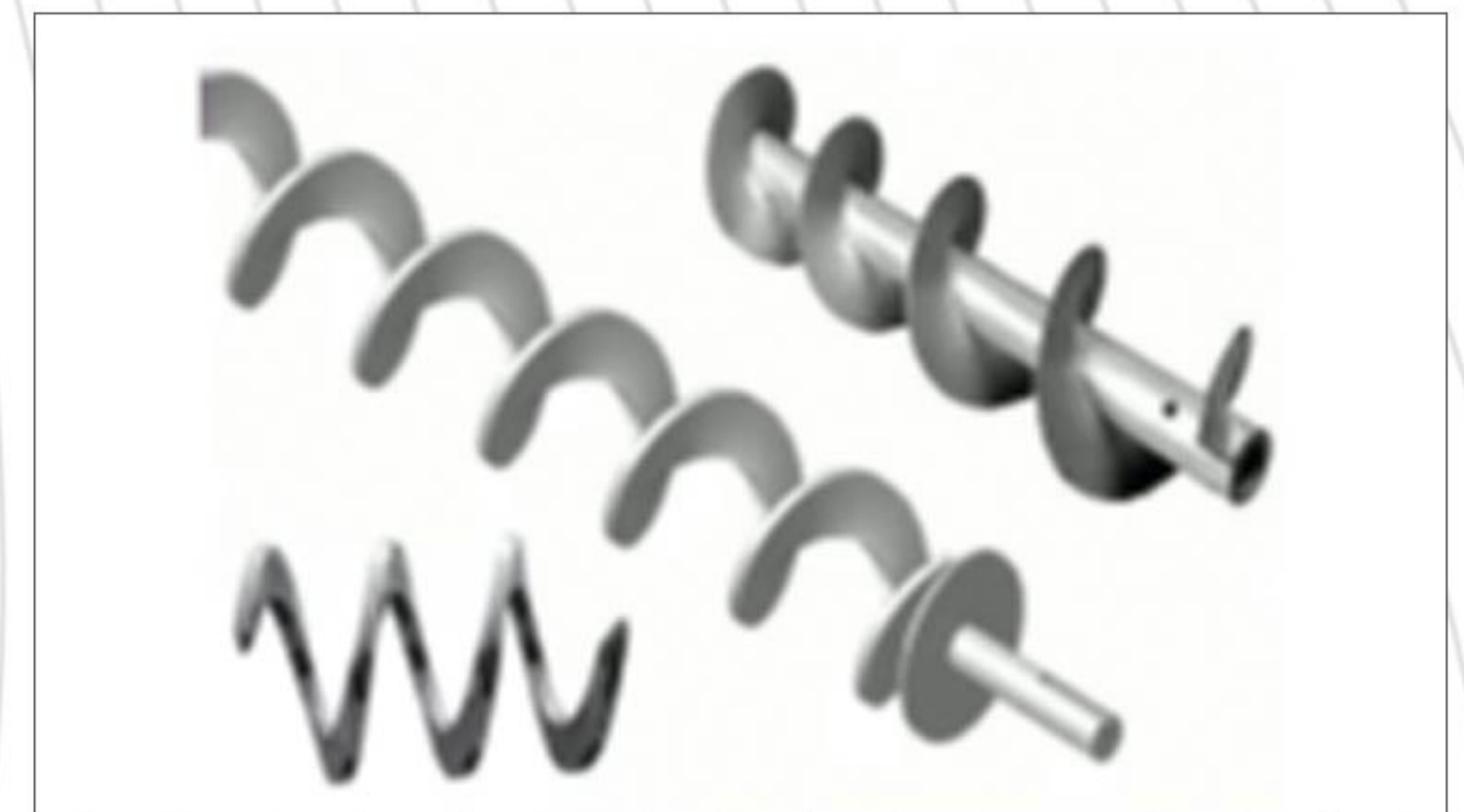
● Screw Mixers

Screw-Mixer is a special type of mixers that has a screw or helix and is used to transfer and mix solid granular or powdery materials in short longitudinal sizes.

● High Shear Mixers

This type of mixer is designed and manufactured by Silverson company. It is designed for high-shear emulsification, decomposition, particle size reduction, dispersion and homogenization of various solid materials in the liquid phase.

In this type of mixers, homogenization and blending are carried out using rotor/stator technology. This technology is used to produce various emulsions, suspensions and solutions in various industries. In the lubricant industry, the use of this technology is important for the breakdown and dissolution of polymers in the production of various motor oils which includes various mechanical seals with a temperature tolerance up to 160°C and a working pressure tolerance up to 10 bar.



In-Tank Bottom Entry High-Shear Mixer

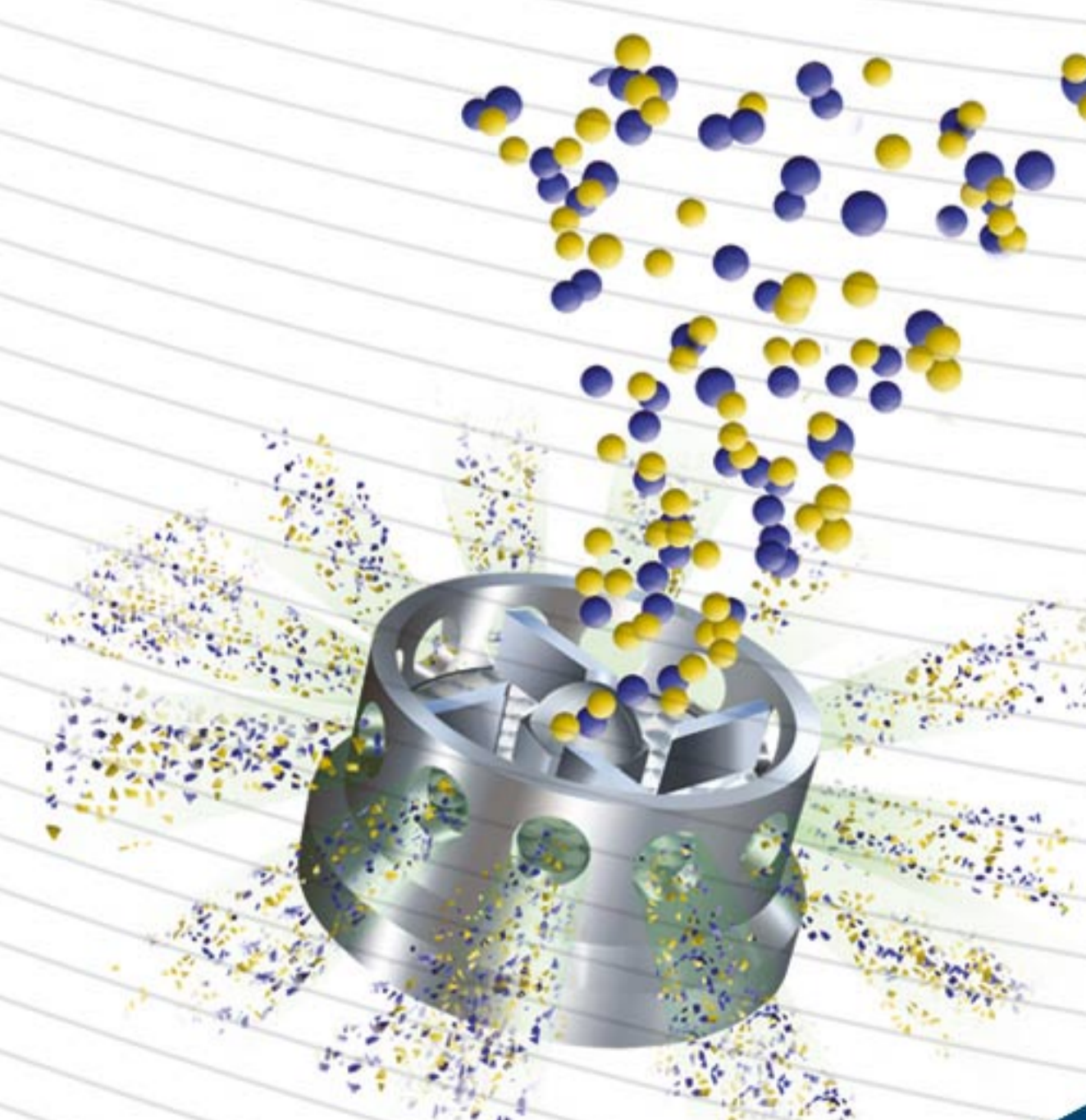
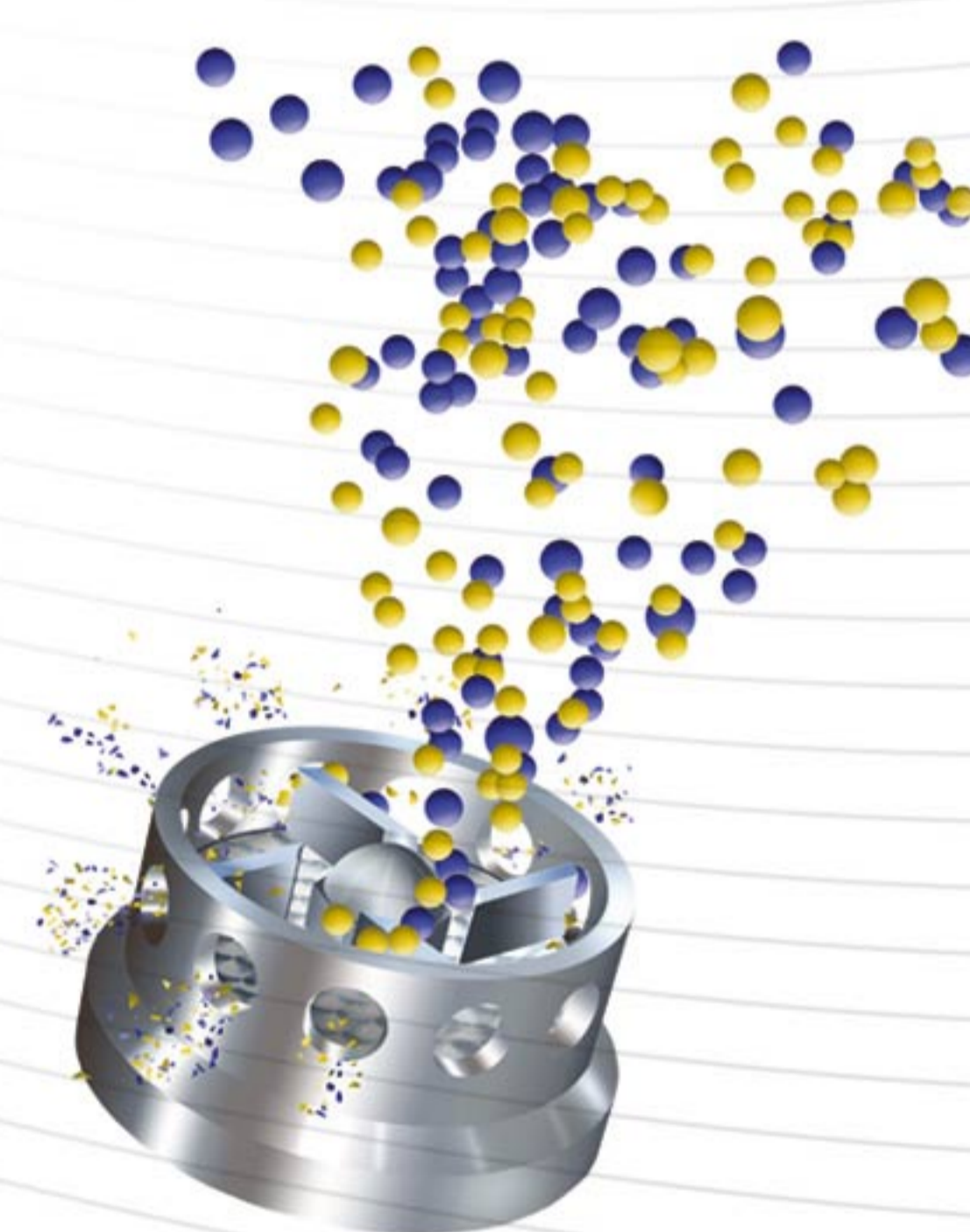
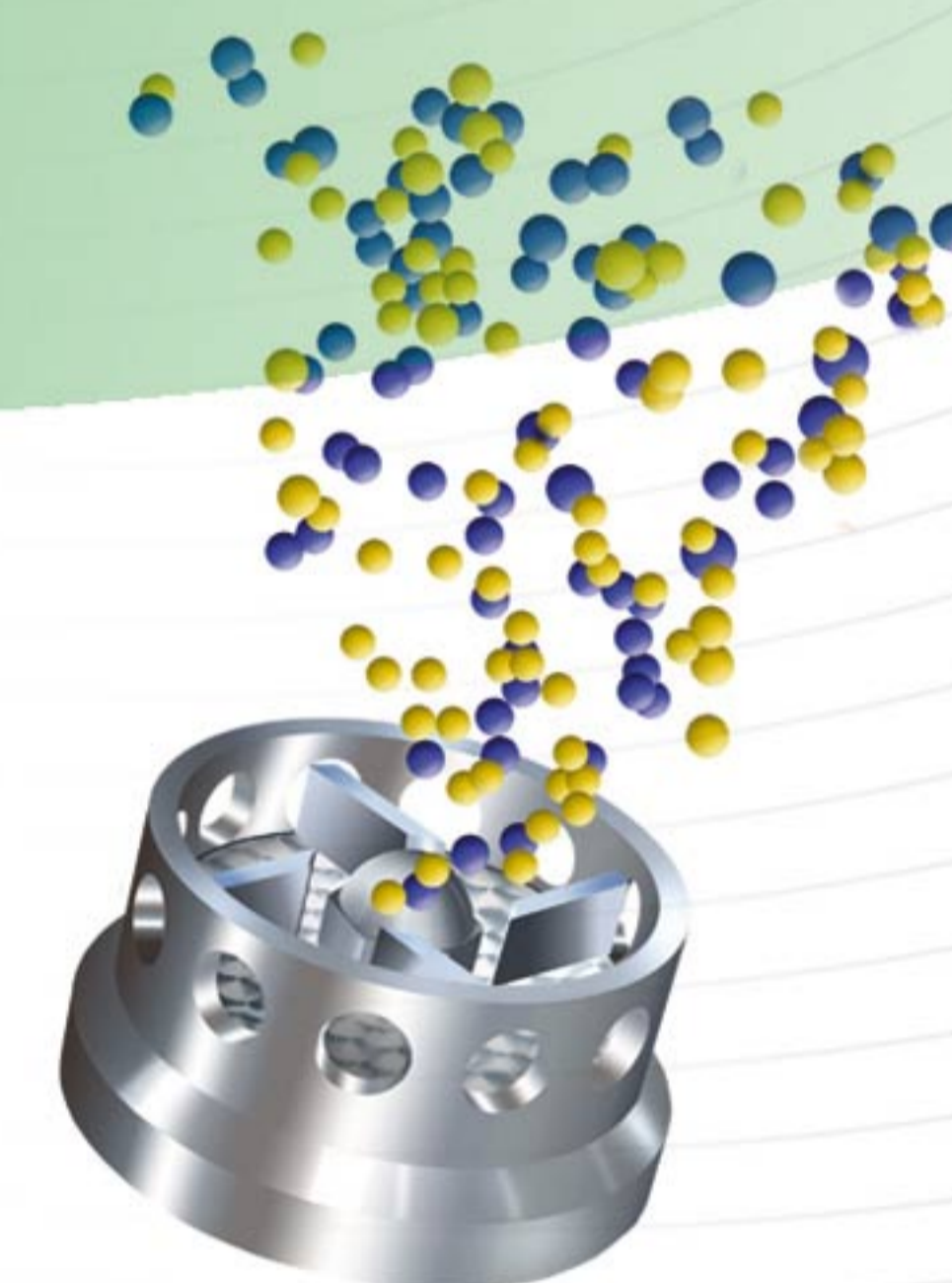
This model of Silverson Mixer is designed by Pishgam Palayesh Force without the need for a shaft and contact with materials inside the mixing tank, also it's installed to the bottom of the tank. This equipment has the ability to homogenize large polymer blocks and optimize homogenization in Low Level and small volumes of materials inside the mixing tank.

This equipment is designed to operate under different working conditions with a temperature tolerance up to 160°C, also under a vacuum pressure and a range of higher pressure up to 16 bar. It should be noted that for optimal homogenization, an In-line homogenizer is also placed alongside the In-Tank mixer.



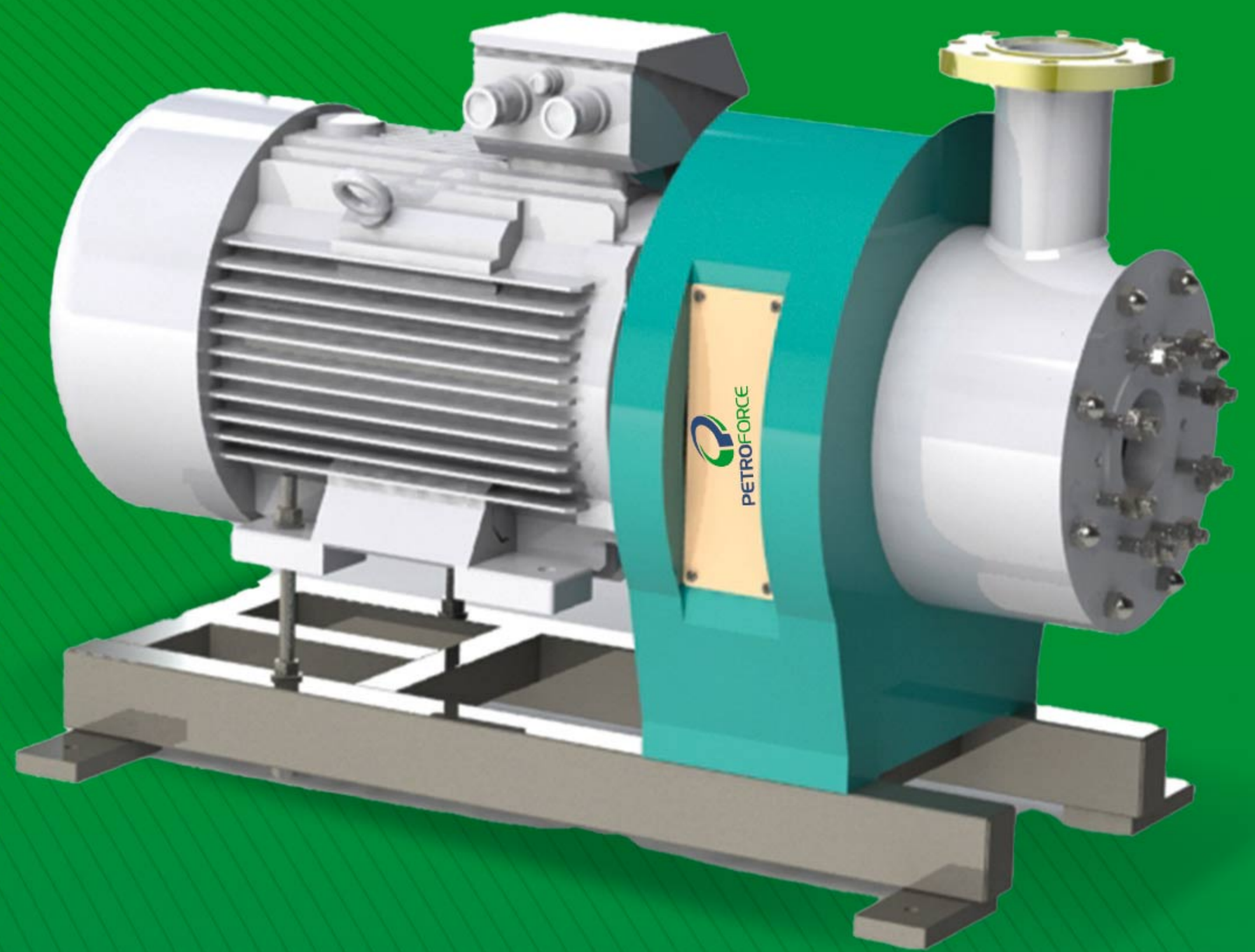
Work Stages

- The high-speed rotation of the rotor blades creates a powerful suction that pulls liquid and solid materials downwards to the workhead center.
- The centrifugal force then directs the materials towards the edge of the workheads, where they are subjected to intense hydraulic shear.
- The mixture of materials is discharged from inside the stator and is thrown radially at high speed into the mixing tank.



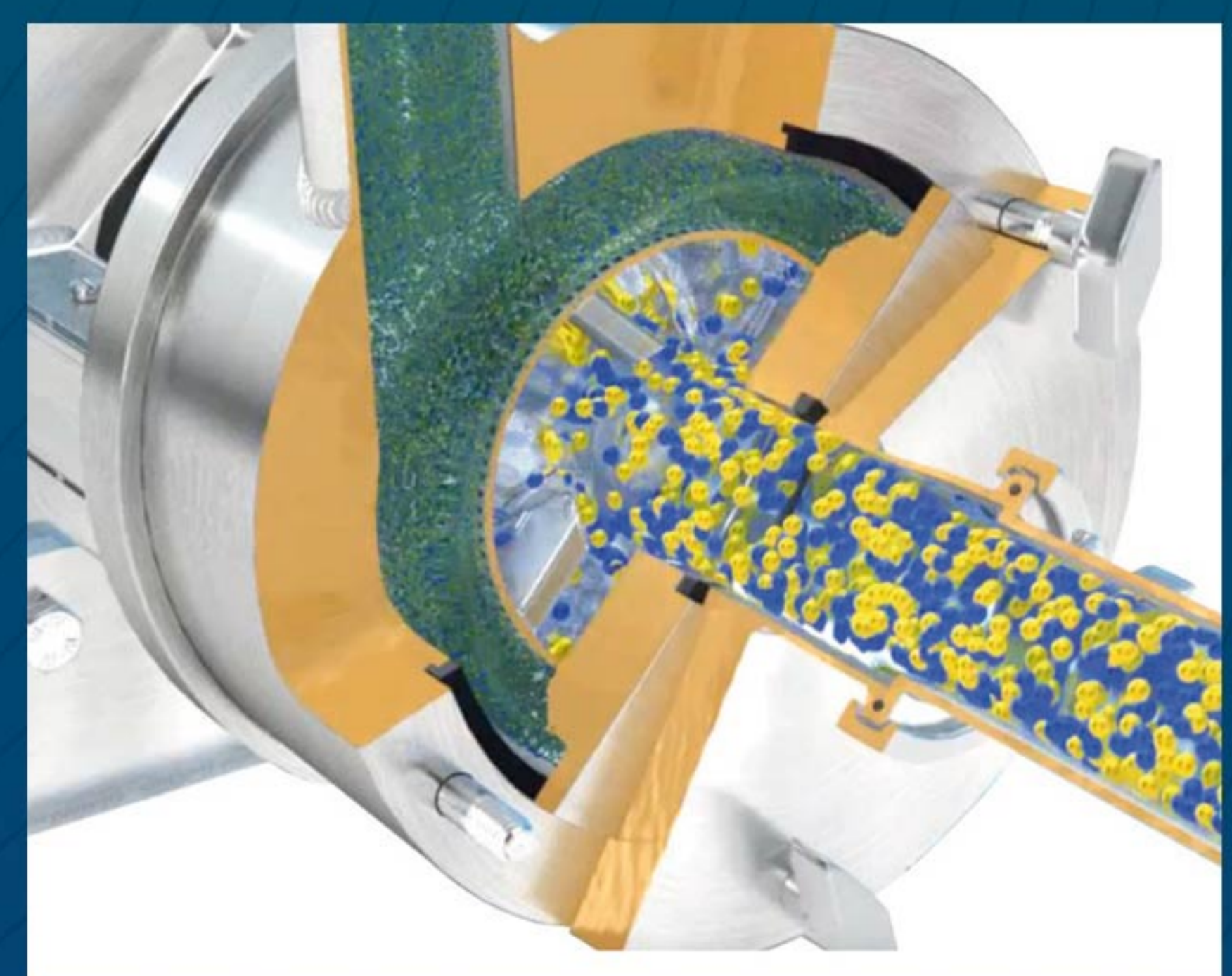
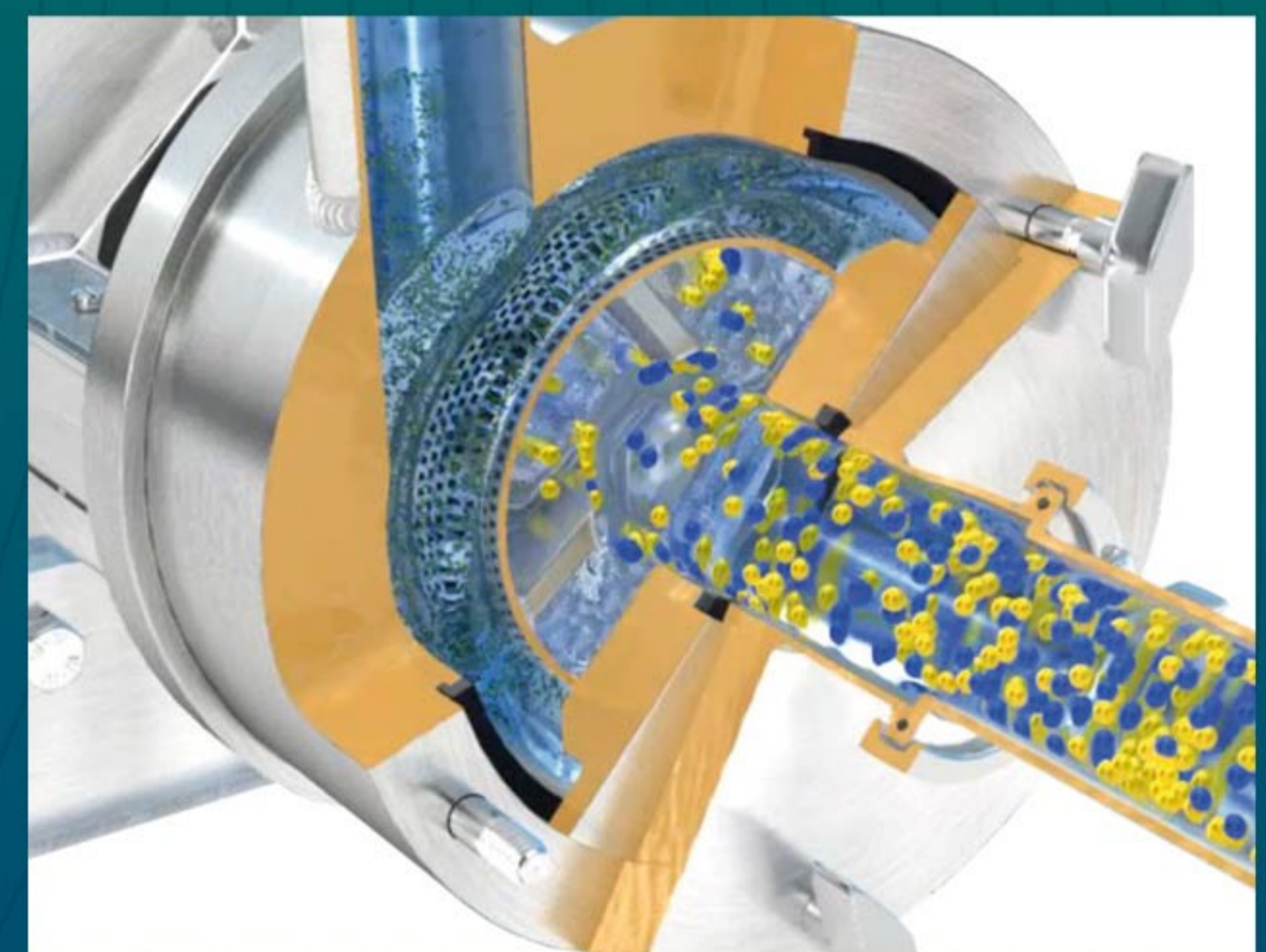
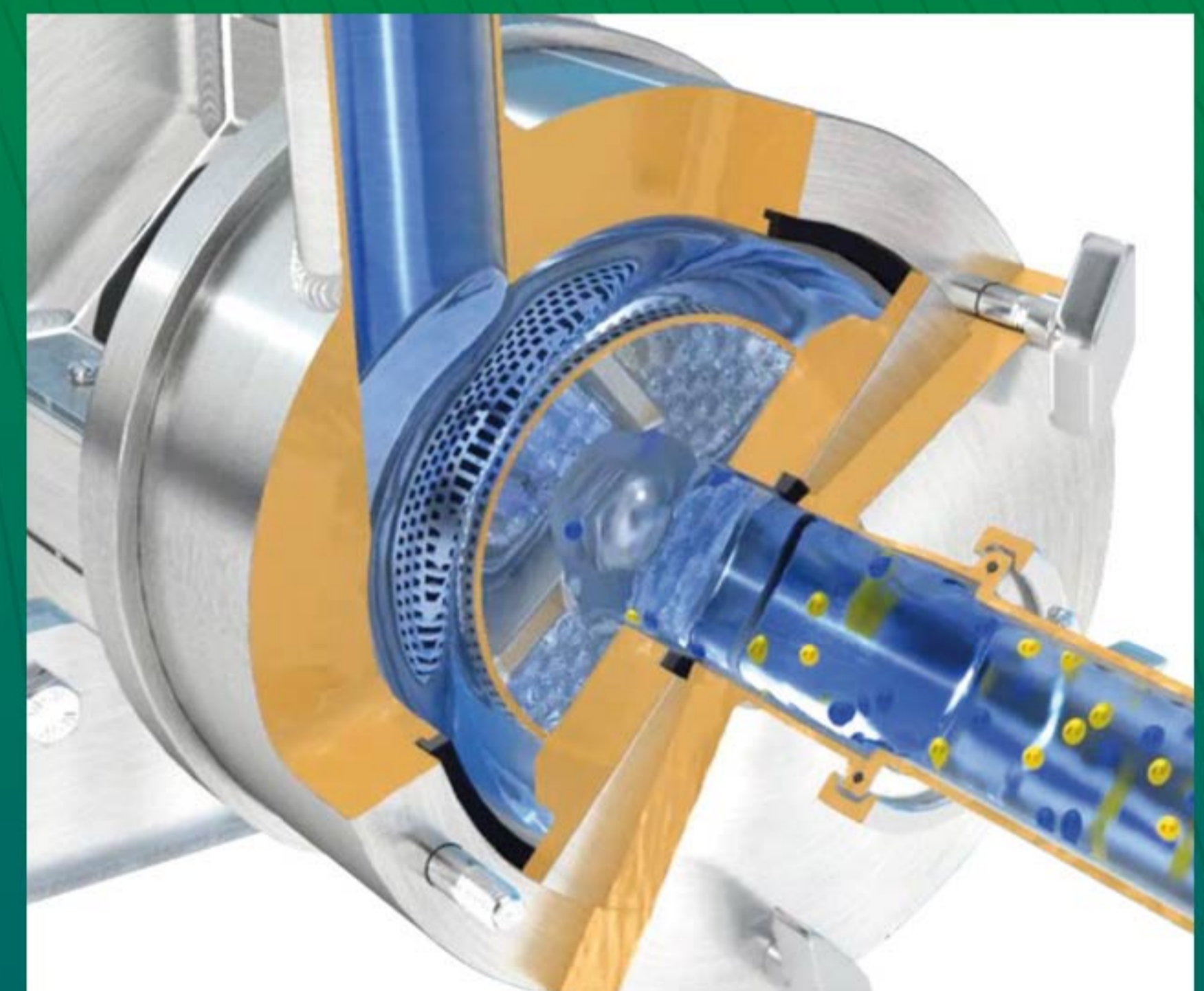
In-Line High Shear Emulsifier Mixer

This Silverson Mixer model designed and manufactured by Pishgam Palayesh Force Company to be placed in the final circulation and complete homogenization circuit of the In-Tank mixer to ensure complete mixing. The high-speed rotation of the mixer causes the mixture to homogenize. This equipment has the ability of self-pumping in fluids with high viscosity up to 1000 cp. Each In-Line mixer can be adapted to homogenize various production processes using interchangeable workheads and is connected to the motor directly and horizontally.



Work Stages

- The high-speed rotation of the rotor blades creates a powerful suction that pulls liquid and solid materials into the rotor/stator.
- The centrifugal force then directs the materials towards the edge of the workhead, where they are subjected to intense hydraulic shear.
- This stage is followed by intense hydraulic shear, which causes the materials to be pushed out at high speed from inside the stator ports and then from the outlet of the equipment with along the piping. At the same time, fresh materials are continuously drawn into the workhead.

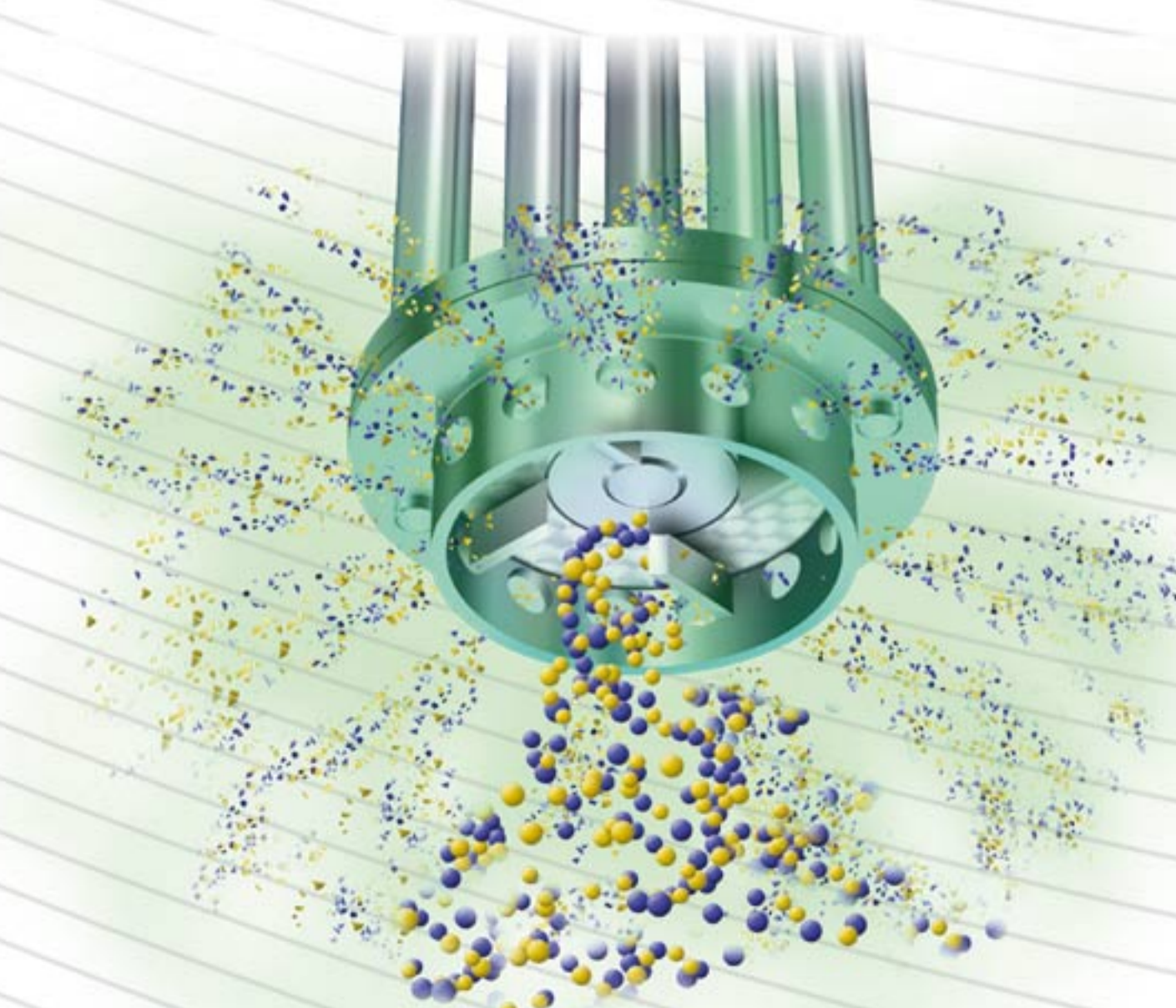
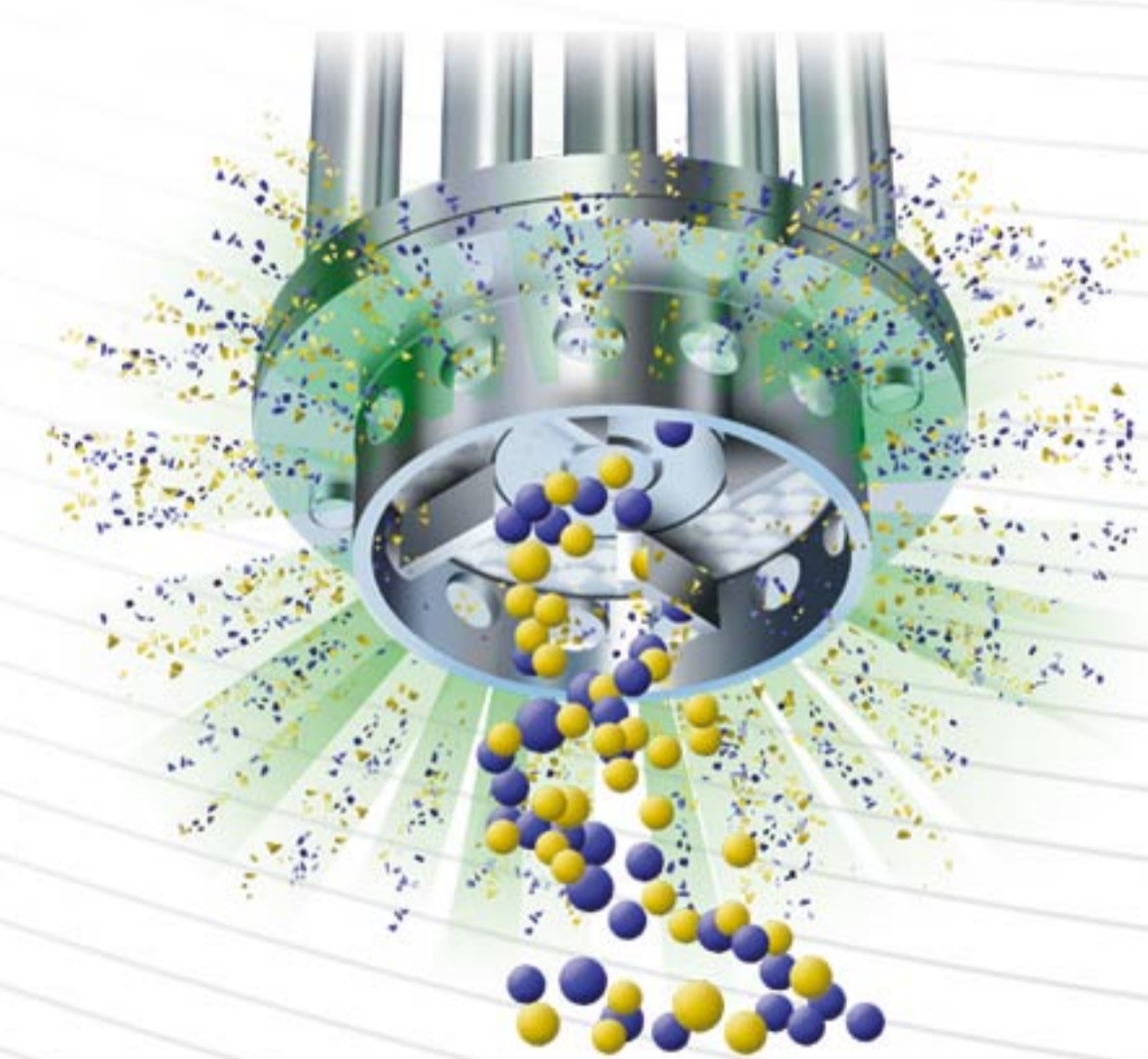
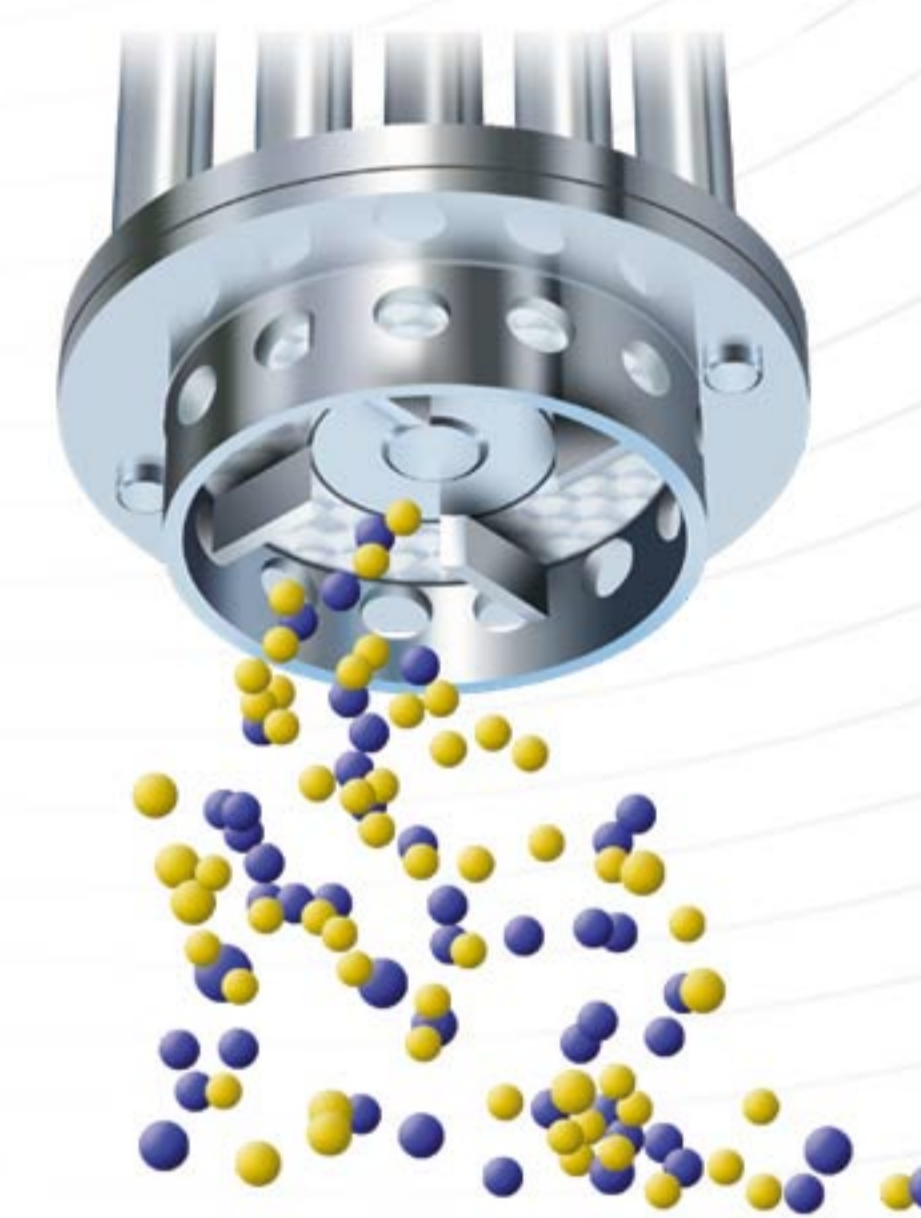
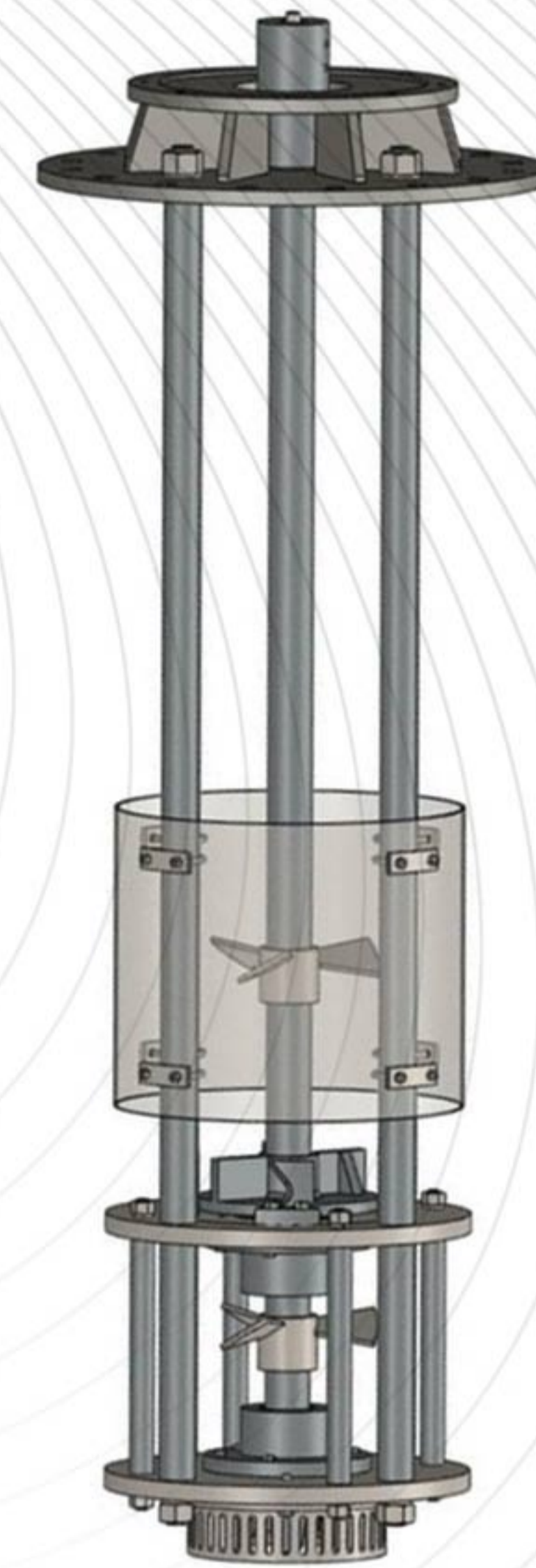


Top-Mounted Duplex High Shear Mixer

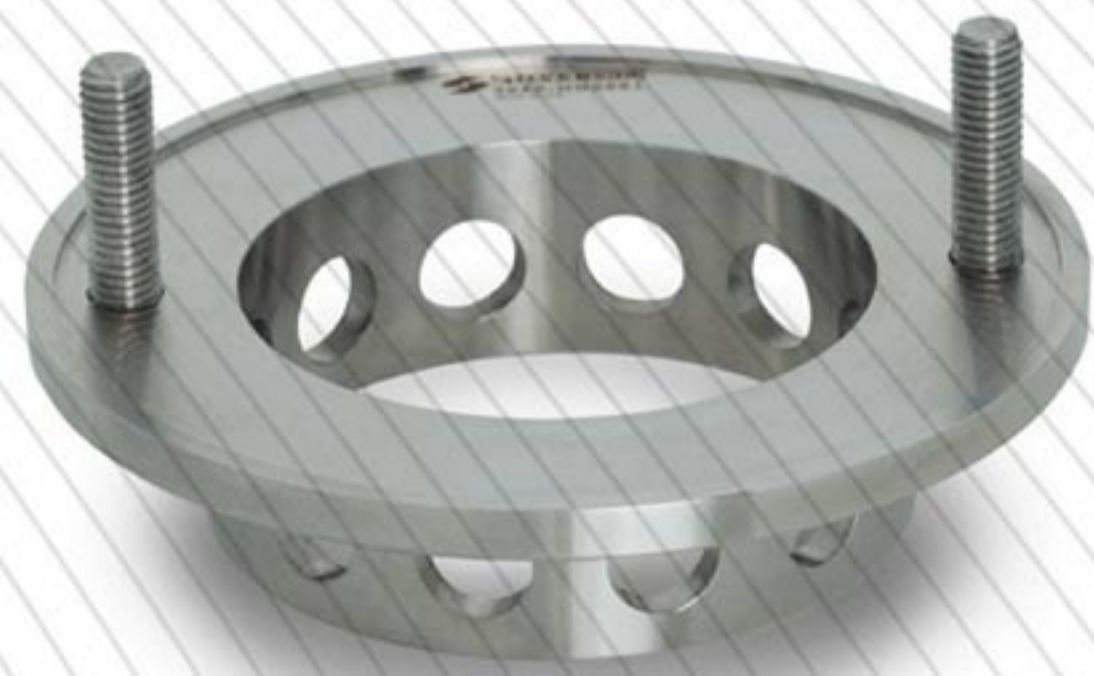
This Silverson mixer model designed and manufactured by Pishgam Palayesh Force Company install on the mixing tank and seals by a system outside the mixing tank. This mixer model consists of two rotor/stator blades and is particularly useful in various process industries, especially in the lubricant industry for homogenizing polymer solutions in the base oil with high performance.

Work Stages

- The high-speed rotation of the rotor blades creates a powerful suction that pulls liquid and solid materials upwards from the bottom of the mixing tank and towards the center of the desired workhead.
- The centrifugal force then directs the materials towards the inner wall of the workhead, where it will completely crush the particles between the outer part of the rotor and the inner part of the stator.
- The materials are ejected from the stator ports at high-speed and a powerful hydraulic force and then mixed inside the tank.
- During the mixing process, the materials are ejected from the desired workhead and move radially at the high speed towards the walls of the mixing tank. At the same time, fresh materials are continuously drawn into the workhead to maintain the mixing cycle.



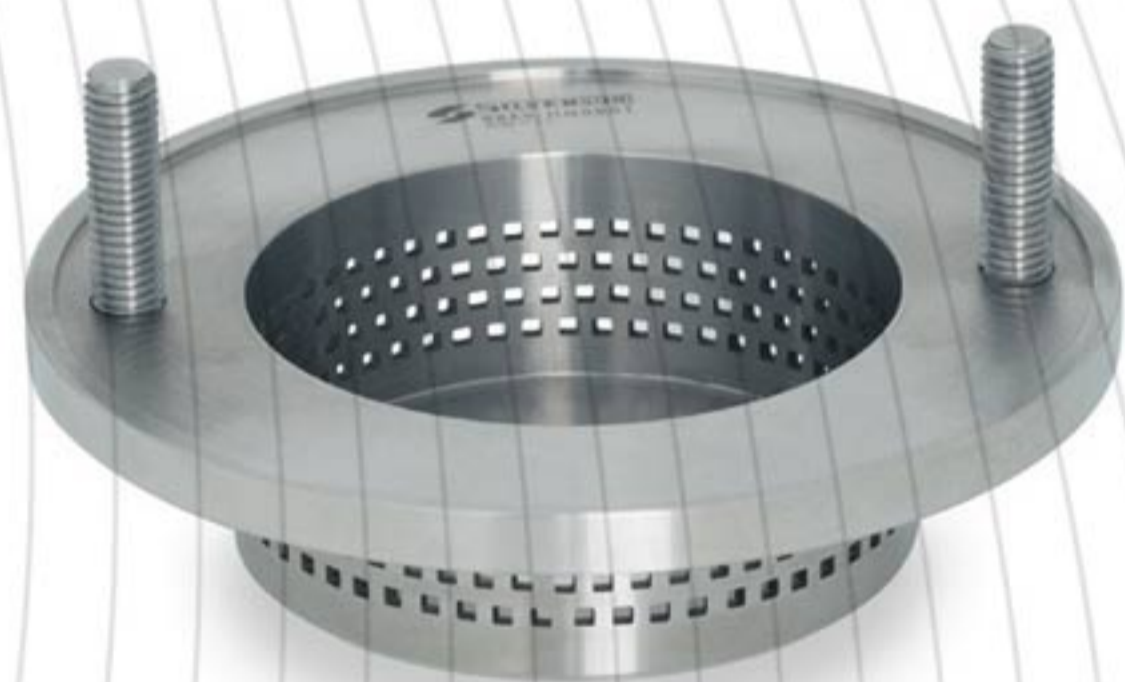
All kinds of Top-Mounted Heads with different applications



Suitable for use in a wide range of industries with super strong mixing action. (General)



For crushing of fiber and dissolving elastic materials (Slotted)



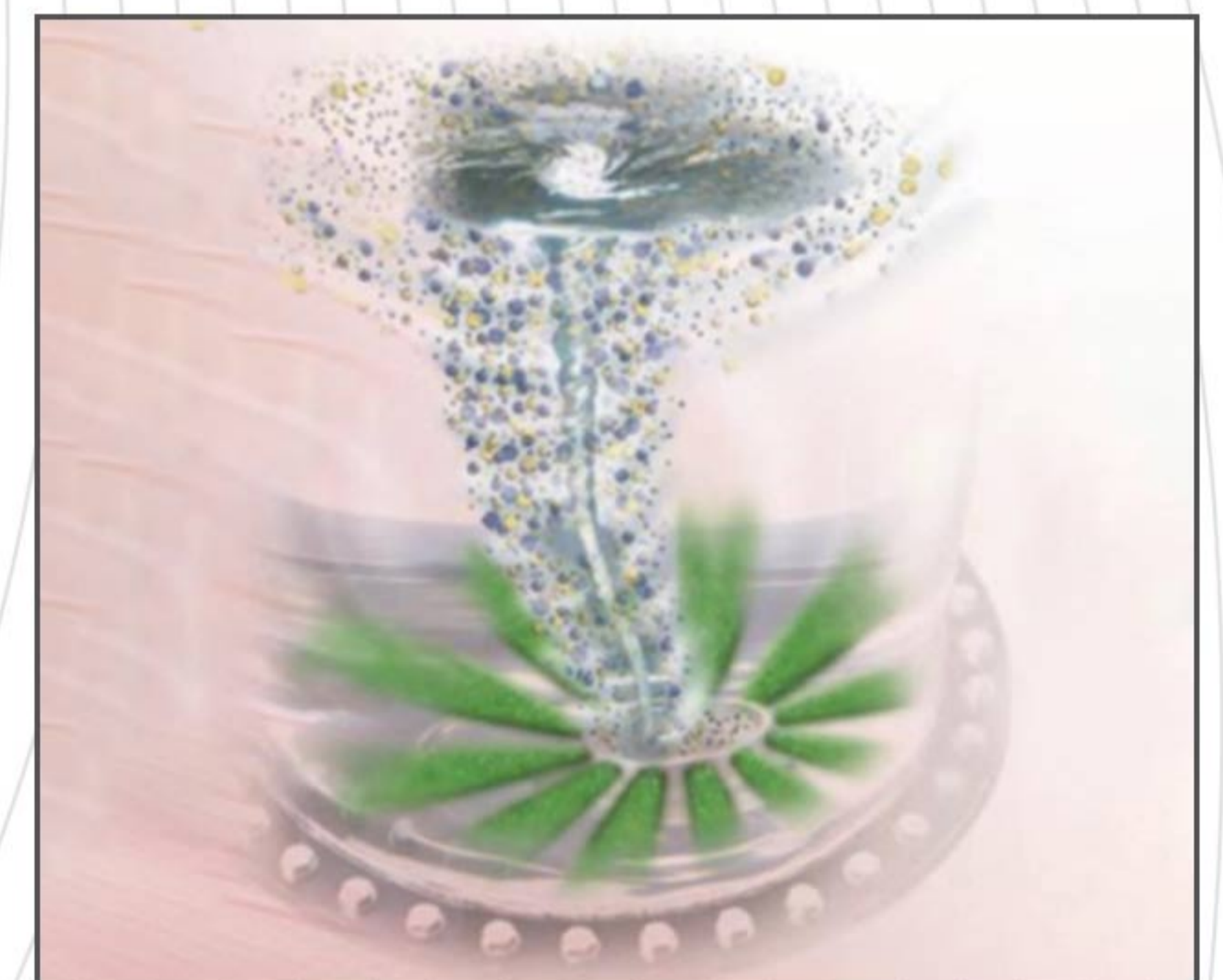
Creating high shear force to rapidly reduce the size of soluble and insoluble granular solids. (Square Hole)



For preparing liquid/liquid mixtures, especially emulsion solutions. (Emulsor Screen)

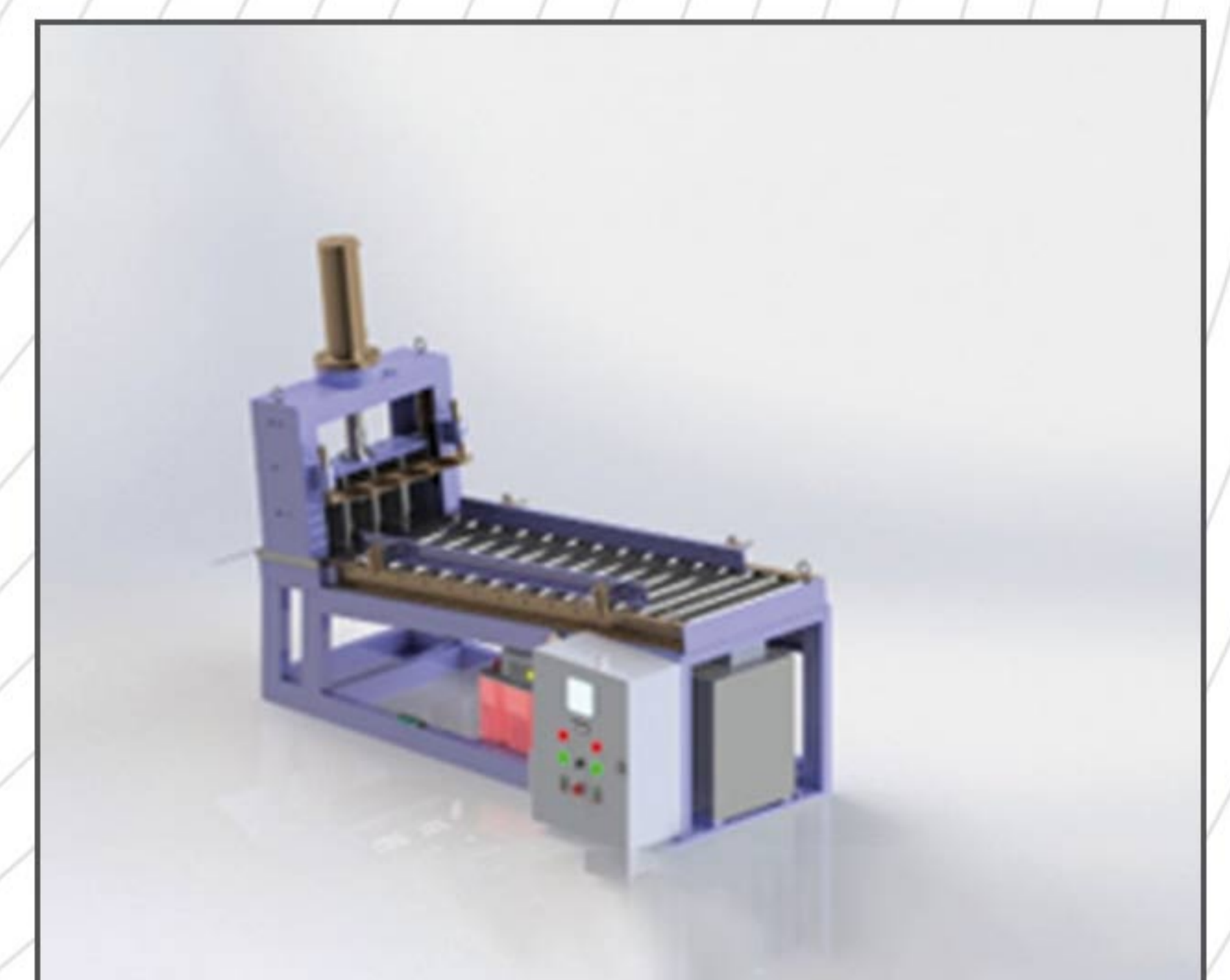
Advantages of High Shear Mixers

- Production of stable emulsion and suspension products
- No need for a pump, due to the self-pumping properties
- Pumping capacity with a wide range
- High volume of production, with the best quality in the shortest time
- Energy conservation
- Interchangeability of the mixer workhead
- Easy maintenance



Polymer Crusher/Cutter

In the production of various lubricants and motor oils, we need to dissolve solid polymer additives in the base oil to increase the viscosity index. Due to the presence of polymers in large dimensions, we need to crush them into suitable sizes. Therefore, a polymer crusher machine has been designed and manufactured by Pishgam Palayesh Force Company, which is placed in the production circuit before the Top-Mounted mixer, based on the order of Iranol Company and several domestic and foreign lubricant manufacturing companies.



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طراحی و چاپ
Besigraphic.com
0912 888 6100

PETROFORCE
Pishgam Palayesh Force

Contact us

www.petroforce.co   +98 25-33343904-5
info@petroforce.co   +98 25-33343906

Central Office

 Unit 3, NO. 4, Abkooch 7th, Pourdad St, Aghaei St, Niavaran, Tehran
 +98 21-22802717
 +98 21-26247792

Factory

 NO. 1112, Boroujerdi 12 St, Hemmat Sq, Shokouhiyeh
Industrial Zone, Qom