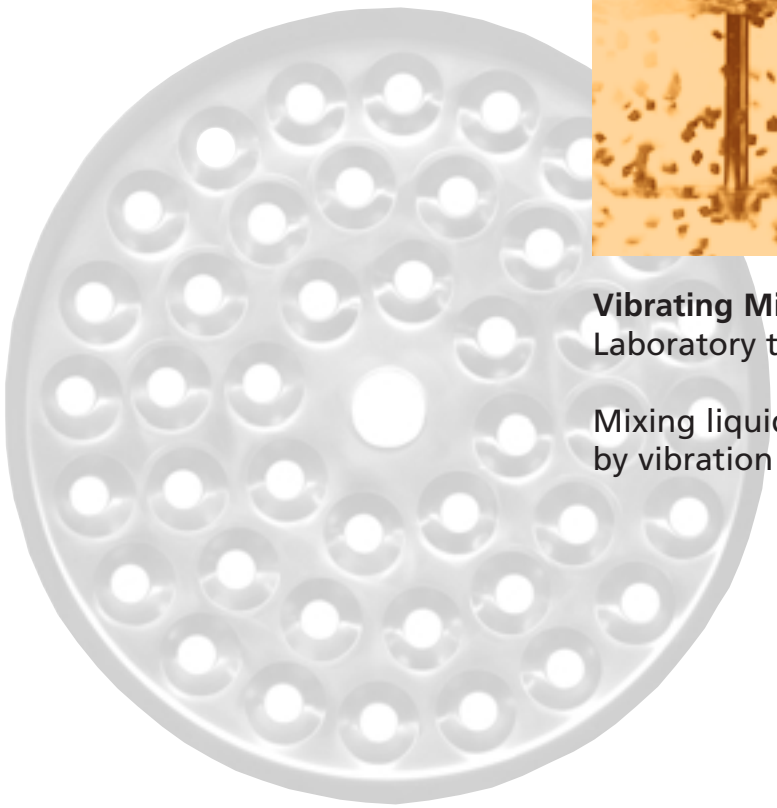
Where liquids are trembling!



Vibrating Mixer
Laboratory type

Mixing liquids
by vibration

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The Mixing Device Without Rotation

The Vibrating Mixer is a universal apparatus for many of the required mixing tasks in the laboratory. It can be used in open or closed vessels, also under absolute sterile conditions and vacuum. A simple membrane seal prevents leakage or contamination. The vessel can be sterilized in an autoclave together with the mounted stirrer. If the vessel is equipped with a pressure membrane seal, the sterilization can be made directly by saturated steam under pressure.

The electro-magnetic drive operates at 50 or 60 cycles and transmits the vibration to a mixing device, e.g. a stirrer, attached to the power unit by a special clamp coupling device. The amplitude/mixing effect is regulated by an electronical thyristor control system from zero to max. 3 mm.

The necessary stirrer execution is determined according to the mixing requirements. If, for example, liquids have to be mixed in a 10 ml Pyrex tube, a stirrer with a plate of only 10 mm diameter is used. If solids have to be suspended in a sterile liquid in a 20 liter storage vessel, a stirrer with a plate diameter of 65 mm is required.

The Vibrating Mixer is also recommended for various shaking applications, such as filling gas chromatographic columns and temperature probes with insulated powders to prevent the introduction of air.

The Vibrating Mixers operate over long periods of time without overheating or variations in the amplitude/mixing effect.

Ideally suited for the following applications:

- Chemical industry: Agitation under vacuum or pressure conditions; preparation of suspensions and emulsions; degasing of liquids; preparation of batch sizes for analysis in the color production field; shaking of diamond powder
- Pharmaceutical/microbiological/food industry: Preparation of sterile emulsions and solutions; mixing of injectable suspensions in sterile vessels for ampoule filling; preparation of vaccine/oil emulsions; anaerobic fermentation; submerse culture of mammalian and plant cells; preparation of uniform solid concentration in liquids; dissolving of solid components in liquids such as salt, sugar, colors and flavors; preparation of soft drinks; disruption of yeast cells; cell precipitation of intestines for analysis.

Most advantages of the Vibrating Mixer

are due to the fact that no rotation occurs:

- No vortex, therefore no foam built up
- No friction, therefore no lubrication
- No rotary mechanical seals, therefore no problems under sterile conditions.

And of course:

- Violent mixing action, therefore no overheating of liquid
- Homogenous distribution and emulsion
- Faster chemical reactions
- Simple installation, low energy consumption, long life time.

Vibrating Mixer Laboratory
Model for mixing volumes
from 0,1 to 20 liters

tested
and conform

Vibrating Mixer Laboratory Set

The complete set is delivered in a box with foam inlays. It consists of:

- Vibrating Mixer power unit type 1, for electrical current 230 V, 50 cycles or 115 V, 60 cycles, 0,6/1,2 amp.
- Electronic amplitude controller for stepless adjustment of the amplitude resp. mixing effect from zero to max. 3 mm
- Stirrer shaft in 316 ss, length 400 mm
- One each adjustable stirrer plate in 316 ss with a diameter of 23, 45, 55 and 65 mm
- Stirrer shaft membrane sealing unit, simple execution, housing in 316 ss, membrane in EPDM (also available in Silicone or Viton)
- Allen head key for stirrer plates, allen head key for stirrer coupling, housing membrane for power unit.

1

Stirrers

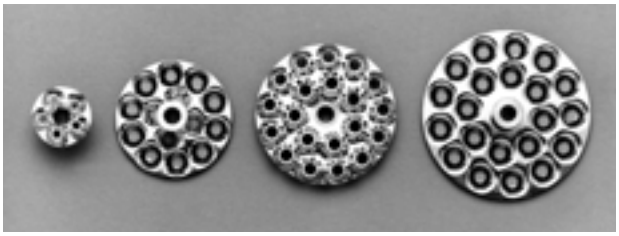
If required, several plates can be mounted on the same stirrer shaft. According to the position of the plate cones, the main liquid flow is from the bottom to the surface (stirrer type A) or vice-versa (stirrer type B).
The stirrer shafts are available in lengths of 400, 500 and 600 mm, the plates are available with diameters of 23, 45, 55 and 65 mm. For degasing liquids, stirrer shafts with a welded-on T-piece are available, in lengths of 400, 500 and 600 mm.
The stirrer shaft and the plates are made in 316 ss. For use in corrosive liquids, other materials such as Hastelloy B or C, Titanium, Pyrexglass and Polypropylene can be delivered on request.

2

Stirrer Shaft Sealing Units

Sealing Unit Simple Design

This sealing unit is used for most applications in closed vessels at max. pressure of 7.5 PSIG. It can be sterilized with an installed stirrer in the autoclave. The housing is made of 316 ss, the membrane is available in EPDM, Silicone or Viton. This sealing unit is mounted in the center hole of a rubber stopper. The stirrer shaft is penetrated through the center hole of the sealing membrane, and the complete unit is placed on the center neck of the mixing bottle.



3

Low Pressure Membrane Sealing Unit

For max. pressure up to 75 PSIG/vacuum. This membrane sealing unit is available in different designs.
All parts in contact with the product are made in 316 ss. The sealing membrane is covered on the product side by a PTFE foil. The connection to the vessel can be made by a TRI-clamp, by a screw coupling DN 25, acc. to DIN 11851, or directly to the vessel cover. Please specify your requirements with your inquiry.

4

Picture 1: Vibrating Mixer Laboratory Set
Picture 2: Standard stirrer (left) and stirrer with gas dispersion
Picture 3: Standard stirrer plates diameter 23, 45, 55 and 65 mm
Picture 4: Low pressure sealing unit 75 PSIG/vacuum (left) and simple sealing unit.

Function Principle
The mixing effect occurs by vibration transmitted to a perforated mixing plate equipped with several conical holes. Due to the Bernoulli effect, this vibration causes the liquid to be pumped upward or downward through the cones.

Plate Stirrer Type A
The cones point upward and the liquid jet-flow goes to the surface. It is used in several applications such as agitation, emulsification and homogenization, with varying liquid levels. If two liquid phases with different specific weights have to be emulsified, the mixing plate must always be immersed in the liquid phase with the higher specific weight. The optimum distance from the mixing plate to the vessel bottom varies between 20 and 150 mm.

Plate Stirrer Type B
The cones point downward, therefore the liquid jet-flow is towards the vessel bottom. This stirrer type is used for suspending solids in liquids and when no air or gas from the liquid surface enters the liquid.

Plate Stirrer Type B with Gas Dispersion
The same stirrer plate is used as in type B described above. Additionally, the stirrer shaft is equipped with a gas connection nozzle and the gas is injected into the liquid under the stirrer plate. Due to the liquid flow, an optimal gas dispersion effect is reached. This stirrer type is used to saturate liquids with CO_2 or nitrogen.

Plate stirrer type A

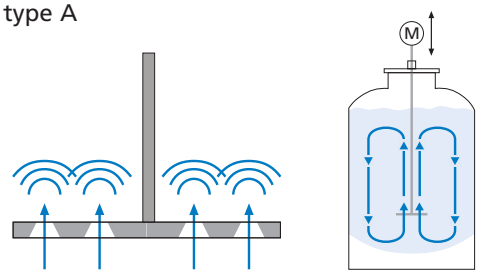


Plate stirrer type B

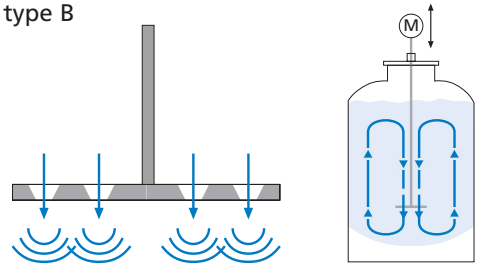
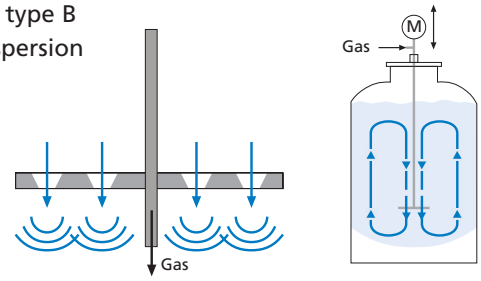


Plate stirrer type B
with gas dispersion



20 liter sterile vessel
equipped with Vibrating Mixer type 1 and pressure sealing unit for operating pressure up to 75 PSIG/vacuum.

Vibrating Mixer Industrial Types
In addition to the laboratory type, the following sizes are available for industrial/production applications:
Type 2 for mixing volumes from 10 to 200 liters
Type 3 for mixing volumes from 50 to 1'000 liters
Type 4 for mixing volumes from 200 to 10'000 liters.
They are mainly used in the chemical, pharmaceutical, cosmetic, food, biological and microbiological industries for various applications such as the preparation of blood fractionations, suspending solids in liquid, sterile suspensions, blending alcoholic beverages, vacuum or pressure destillations and gas/liquid reactions such as hydrogenations and neutralizations.
Please request our detailed documentation.