

NETZSCH Planetary Mixer PMH 1000 for the Production of Silicone Sealants

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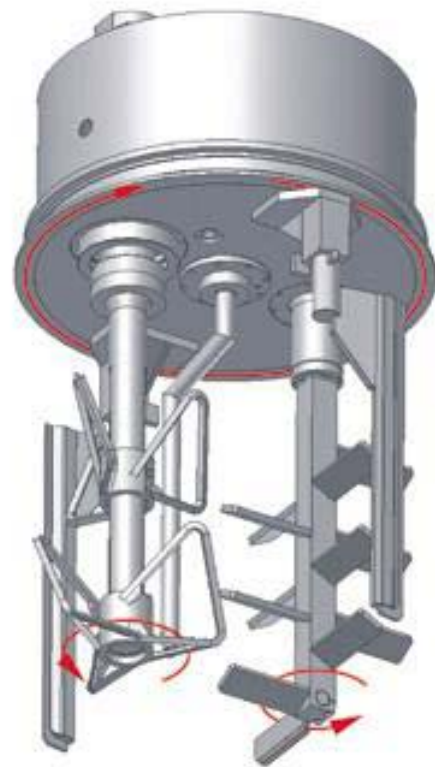
The NETZSCH planetary mixer type PML/PMH is successfully used in the production of products in a wide viscosity range from 1.000 mPas to more than 5.000.000 mPas. Laboratory and pilot plant scale machines up to full scale production units are available. The laboratory planetary mixer type PML 1 or PMH 1 is available from 0.5 to 0.7 l working volume and conventional steel cans may be used as tanks. The production machines type PML and PMH are built up to a tank volume of 1600 l.

Mixing system

The mixing system guarantees energy-saving short mixing times while maintaining product quality, especially for production of high-viscosity and temperature sensitive pastes and sealing materials. The planetary action of the mixing arms produce a circulating movement in the stationary tank that passes through the entire mixing product. The product is transported by a moving scraper into zones with high mixing and kneading intensity. NETZSCH-Feinmahltechnik GmbH produces two types of planetary mixers:

PML – two mixing arms directly driven via the planetary system. The flow blade stirrer arm gently mixes the product. This type of machine is especially suitable when very low product temperatures are required and the viscosity should be kept constant during the mixing process.

PMH – one flow blade stirrer is driven via the planetary system. A second high-speed dispersing tool is available and has a separate drive unit. High energy input with intensive mixing and kneading effect are achieved by the combination of low-speed flow blade stirrer and high-speed dispersing tool. This is especially necessary for the preparation of high-viscosity pastes and sealing masses.



For both systems an optional thermo probe rotating in the product can control and indicate the product temperature. The speed of the independently driven mixing systems can be adjusted by hydrostatic drive or by an optional frequency inverter from “0” to maximum speed.

Press Out systems

For discharging the system the tank press out devices type BP is available and used for emptying medium to high-viscosity products. Sizes from 30 - 1600 l tank volume can be supplied for production machines. They can be equipped with a special vacuum cover as an option.

For the 8 - 15 l tank volume laboratory planetary mixer an optional manual press out device can be used in the existing machine stand.



Tank press out BP 1600

Applications

For dispersing finely pulverized and soft components in liquid batches in very short times, mixing tools such as flow blade and butterfly stirrer or different dispersing disks are available. Preferred fields of application are temperature sensitive sealing materials, adhesives, highly pigmented pastes, fillers, rust protection, plastisol etc.

Advantages of NETZSCH Planetary Mixer type PML/PMH

- stable, reliable construction
- homogeneous mixing of different components
- short mixing times for high-quality product qualities
- product optimized mixing and dispersing tools
- easy cleaning
- direct temperature measurement in the product by rotary thermo probe
- variable speed
- independent dispersing drive for series PMH
- vacuum-tight and Explosion protected design from laboratory scale to production machine

Fully automatic planetary mixing plant at TKK in Slovenia

In 2005 a state of the art plant for the production of silicone masses was installed at TKK in Slovenia. The essential element of the fully automatic plant is the planetary mixer PMH 1000 produced by NETZSCH-Feinmahltechnik GmbH. One ton of product is processed within 50 minutes. A fully automatic control system for the machine and the additional liquid and solid dosing system was supplied by NETZSCH. Completing the system are two tank press outs for feeding the two cartridge filling stations. Manual, semiautomatic or fully automatic operation of the plant is selectable within the control system.



The first step for starting a batch is liquid dosing. Polymer and silicone oil are pumped into a mixing tank located on a process scale. Different additives are mixed in and the liquid dosing is started. Feeding of the liquid components is controlled via nozzles, which are equipped with automatic shut-off valves.



Liquid connections with check valves

Initially the mixture is stirred without vacuum and then under vacuum (500 mbar). The solid dosing begins by. Pre-weighing approximately 50 kilograms (1.6 m^3) of silicone dioxide using a special process scale. This process is completed within 5 minutes. After a further 5 minutes the silicon dioxide has been completely and homogeneously mixed into the silicone mixture. Compared to a common planetary mixer the mixing time of the silicon dioxide is considerably shortened (50 %) with the NETZSCH planetary mixer PMH 1000. Approximately 360 kg of calcium carbonate and other additives for improvement of the adhesive characteristics are fed in the next step. The mass is mixed under vacuum and de-aerated and finally homogenized at the same time. After finishing this step the speed of the machine is lowered to minimal speed.

For control of the product quality the machine is stopped and the mixing head is lifted. After achieving the desired viscosity and homogeneity the tank with the mixed material is brought to the tank press out type BP 1000. The contained mass is filled into cartridges within two hours.



The cleaning of the mixing tools is done manually with a scraper. The tanks can be cleaned with a high-pressure water cleaning plant. The planetary mixer, including feeding, can be operated both locally or from a switch room.

With the NETZSCH planetary mixer PMH 1000 as the heart of this fully automatic plant, it was possible for TKK to increase the productivity for producing silicone masses. The mixing time of the silicone dioxide was extremely shortened due to the specially adapted mixing tools in combination with the planetary system in the PMH 1000. Beyond that automation ensures constant product quality of the batches.