

Anlagentechnik

Core Sand Mixers



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In order to optimise the core production process in regards to core quality and productivity, the core sand processing equipment has a significant influence, in addition to the core shooter itself.

The core sand processing equipment has the following requirements:

- complete wetting of the sand particle surface with binder;
- short mixing time to achieve a homogeneous mixture;
- effective mixing with low energy consumption;
- complete emptying of the mixer trough;
- low binder consumption at high core quality;
- low wear and maintenance costs.

Based on their decades of experience with various mixer types, KLANN developed a special mixer for the batch production of the standard binder-sand mixtures used in core shops. This mixer, type PKM, has proven its reliability in over 10 years of production.



Pic.1: PKM core sand mixer in tilting position, using a volumetric dosing device.

In comparison with standard mixers the PKM mixer has high mixing power, by occupying a small installation area. Depending on the mixer size, a 30 – 50 litre batch of high quality mixture is produced within 70 -90 seconds.



Pic.2: PKM core sand mixer in emptying position on mixer platform

The overall design and the slightly inclined mixer bin with the spherical bottom ensure complete mixture without any dead zones. Whereas other mixers use 2 or 3 times more engine power for the mixing tools, the KLANN mixer only uses 2.2 kW for a 30 litre design producing more than 2 tonnes of mixture per hour. The energy is effectively used and heating of the mixture, which could result in an earlier hardening process, is avoided.

By the mixer's tilting bin design for emptying the mixture trough the material feed opening, the use of flaps and sliders is avoided. As no flaps and sliders are used for material discharge. There are no problems with plugging or clogging by hardened mixture.

A small vibrating device on the mixer trough supports the complete evacuation of the bin so that no downtime of the mixer due to cleaning operations is required.

This tilting bin design makes the positioning of the mixer on the easily accessible floor level of the core shop possible. The produced mixture is then automatically fed into one or several core shooters by either a Klann travelling hoist gear system or a bin lift.

The introduction of binder into the mixture is executed by pressure from above with special nozzles. The position of the binder feed and the binder jet type assures a fast and complete intrusion of the binder into the mixture. The optimum design of the mixer and the binder injection is shown by the fact that no binder residue occurs on the mixing tools or the mixer walls. In combination with the sand and binder dosing devices the optimised consumption of the raw material is ensured.

The sand feed can be dosed either by a volumetric dosing device or by a weighing device. The volumetric dosing device allows fixed half or full mixture loads. The weighing bin offers variable loads of different raw material and additives to a certain precision. These dosing devices are offered by KLANN as part of the core sand processing equipment.



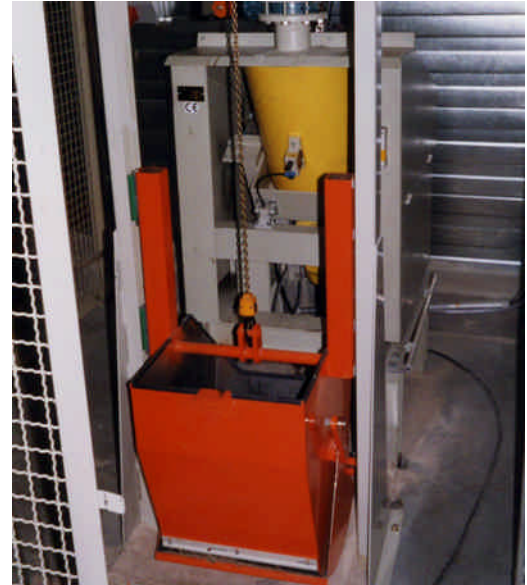
Pic. 3: Mixer with a weighing bin for material dosing

To supply several core shooters from one mixer with core sand, the mixer volume is kept low. A larger mixer charge would cause a longer retention time in the core shooter supply bin and therefore a surface drying or pre-hardening of the mixture. This could lower the core quality and core shooter availability.

The standard technical data for the PKM-mixers are:

Mixer type	Volume	Motor power	Production
PKM 30	30 litres	2.2 kW	2,160 kg/h
PKM 40	40 litres	4.0 kW	2,880 kg/h
PKM 50	50 litres	5.5 kW	3,660 kg/h

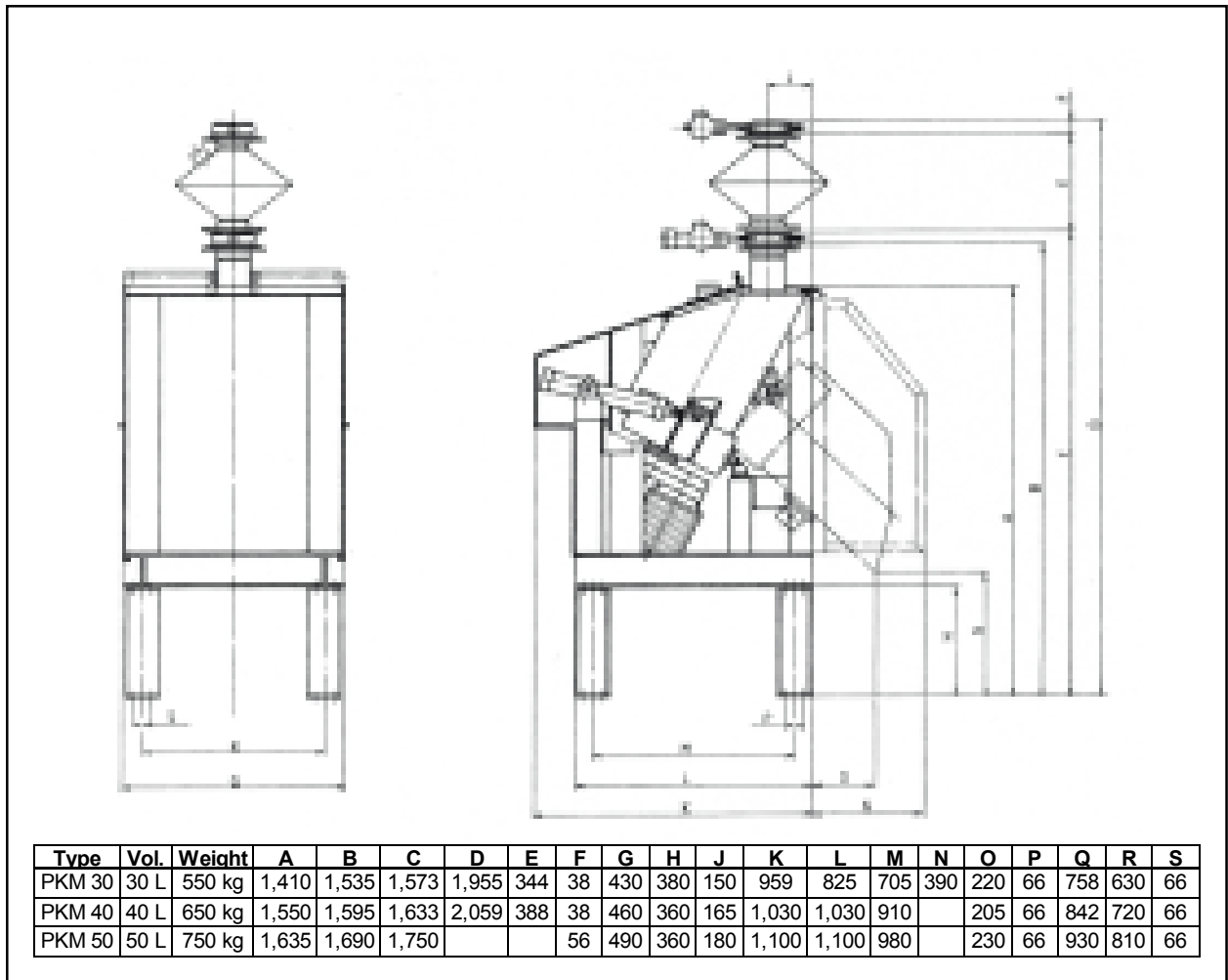
The use of batch mixers instead of continuous mixers ensure uniform, controllable retention time in the mixer and therefore an optimum mixture. Batch mixers guarantee an optimum mixture with the first batch, whereas continuous mixer produce low-grade material during start-up.



Pic.4: Mixer used in combination with a travelling hoist gear transport device to allow the mixer installation on the floor level

By the downstream use of a batch transport system for the mixture, a defined transporting time to the shooting machine is achieved. This defined retention time for the transport is not guaranteed by the use of belt or screw conveyors in combination with continuous mixers, so that by the use of batch processes for the sand processing a different core sand hardening status can be avoided.

These special PKM mixers have shown their reliability and performance in different core sand processes, like i.e. Cold-Box, Hot-Box, Resol, CO₂, Betaset and anorganic processes. They are known for their high degree of automation and low downtime for maintenance and cleaning.



Sketch: Dimensions of the PKM mixer including the volumetric sand dosing device

Also available for cast shops from **KLANN Anlagentechnik**:

- Turn-key core shops
- Standard core shooters
- Core belters
- Binder dosing systems
- Drum and container storage facilities for binders
- Core sand transport/distribution systems
- Core fraction recycling units
- Pneumatic conveyors
- Silo storage- and dosing systems
- Sand dedusters and cooler
- Automation and Control Systems
- Core handling/robot systems