

AM DOUBLE SIGMA KNEADER



AM

DOUBLE SIGMA KNEADER



AM DOUBLE SIGMA kneader is one of the most advanced equipment developed for the kneading, mixing, and homogenization processes of wet or pasty products of very high viscosity. They are robust and safe equipment, adapted to each manufacturing process, offering a very cost-effective solution.

Its field of application is extensive: manufacturing of putties, hot-melts, ceramic pastes, explosives, as well as for meat coatings, caramel, etc.

OPERATION

It is a batch operation equipment, with an operation cycle as follows:

- » Loading of one or several products through the inlets arranged in the lid.
- » Kneading.
- » Emptying by tilting the trough or through the bottom.

The mixing is carried out by the action of two double-sigma blades (the most common), located at the bottom, which rotate at different speeds and in a convergent direction, following a figure-eight circuit. This equipment can work under vacuum and/or pressure, and optionally, they can have a jacket for heating or cooling both the trough and the end walls.



with you, step by step

Technical features

The most common discharge system in this equipment is by tilting the trough. This is done by installing a telescopic hydraulic cylinder at the bottom of the equipment, which lifts and tilts the trough, and is driven by the hydraulic unit for lifting the lid. Depending on the process requirements and on demand, it is also possible to perform tilting using an electric system consisting of a geared motor with brake and support on the equipment frame.



AM-400 kneading with tilting system by means of gear-motor.



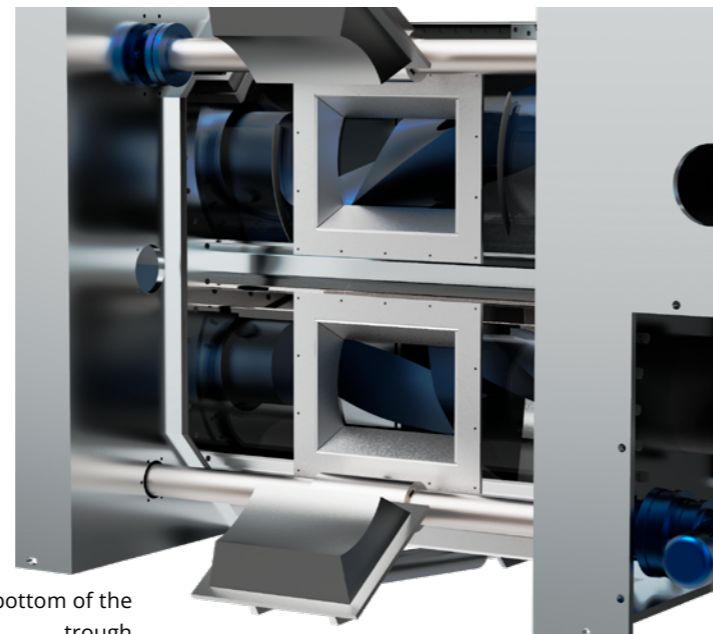
AM-400 kneading machine with hydraulic cylinder for tilting

We also have another version of these mixers that discharge through the bottom of the trough; in this case, a gate is installed in each compartment of the mixing body. Each gate has an independent drive that can be electric or hydraulic, depending on the process requirements.

The main advantage of this unloading system, compared to the tilting system, is the no product manipulation for a complete unloading, thus avoiding possible contamination.

TROUGH

The inside of the trough is completely smooth, which facilitates the cleaning of the equipment. Optionally, it can incorporate a double chamber, a half-pipe coil, or a dimple jacket for heating with steam or thermal fluids, as well as for cooling. For processes in which maintaining the internal temperature is crucial or where the heat transfer to the outside is very high, insulating are installed, and it could be of different materials: rock wool, polyurethane foam, etc.



Discharge gates installed in the bottom of the trough



We have equipment prepared to work under atmospheric pressure or under vacuum, incorporating special sealing gaskets in the equipment's lid.

Depending on the product to be processed, the troughs are built in carbon steel, AISI-304 or AISI-316 stainless steel or, upon request, in duplex steels or with specific coating materials for chemical corrosion and abrasion.

BLADES

Due to their unique design and large diameter, the kneading blades are highly effective in mixing processes with high viscosity pastes. There are three modes of construction:

- » Cast carbon steel blades with ground edges.
- » Carbon steel blades with a polished stainless steel cover.
- » Solid cast stainless steel blades.

They are machined laterally, according to the trough. The shafts are hot-inserted into the blades, with successive welding beads providing high torsional strength. These are machined and incorporate protective bushings in hard chrome or ground stellite, which prevent wear in the area in contact with the stuffing box.



Double sigma blades

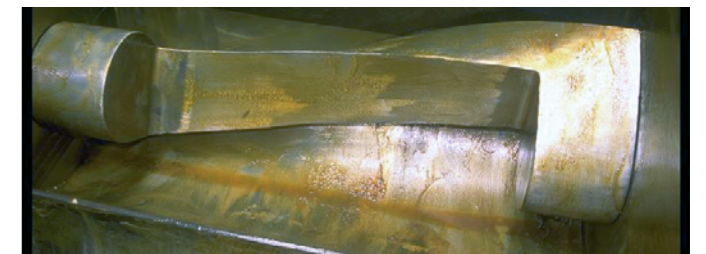
For some products, it is essential to maintain a stable temperature. In these cases, the mixing blades can incorporate an internal circuit for heating or cooling by means of the same fluid used in the double chamber of the trough.



Double nabes blades

According to the production process, Lleal offers four blade designs:

- » Double sigma blades (the most common) are indicated for materials requiring a large movement inside the trough. They are the most versatile and are used in both the general chemical industry and the food sector.
- » Double nabes blades, suitable for kneading highly viscous products such as gums or cellulose.
- » Double Z blades at 135° or 180° inclination are especially indicated for materials requiring less shearing force.
- » DF-type blades, suitable for abrasive or difficult-to-mix materials such as gums, plastics, resins, or polyurethanes.

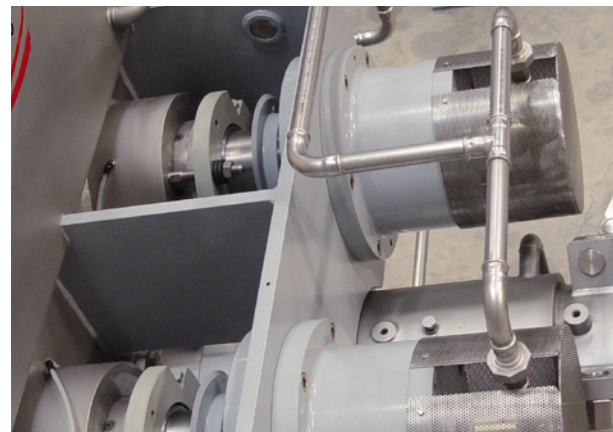


Z to 135° blades



DF-type blades

Technical features



STUFFING BOX

The blade shafts are equipped with two stuffing boxes sealing the inside of the trough. They are of split design, which facilitates access for easy maintenance of the glands, and their long design ensures perfect sealing. The glands are square profile with PTFE or PTFE/graphite braiding.

We have specific solutions with special seals for working under vacuum, sanitary designs for easy cleaning, heated versions, etc.

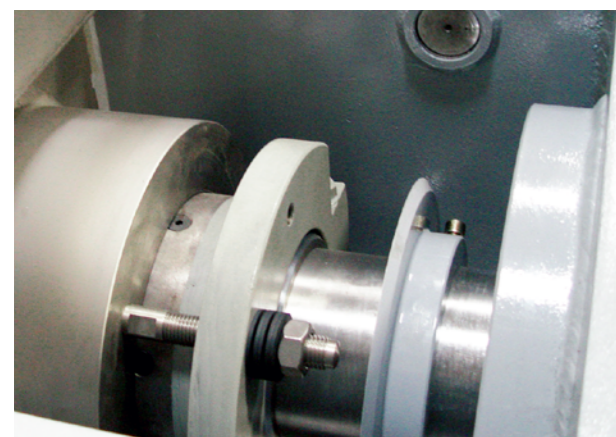
TRANSMISSION

We have two types of transmission for these kneaders:

Mechanical transmission, by means of an electric geared motor driving a system of gear teeth-reducers connected to the arms, achieving a convergent movement at different speeds.

Depending on the power required, the drive unit is independent with mechanical coupling and frequency converter. For high power equipment, we have a drive system consisting of two geared motor units, directly coupled to the arms.

The power of the drive units is calculated according to the viscosity and volume of the product to be kneaded.



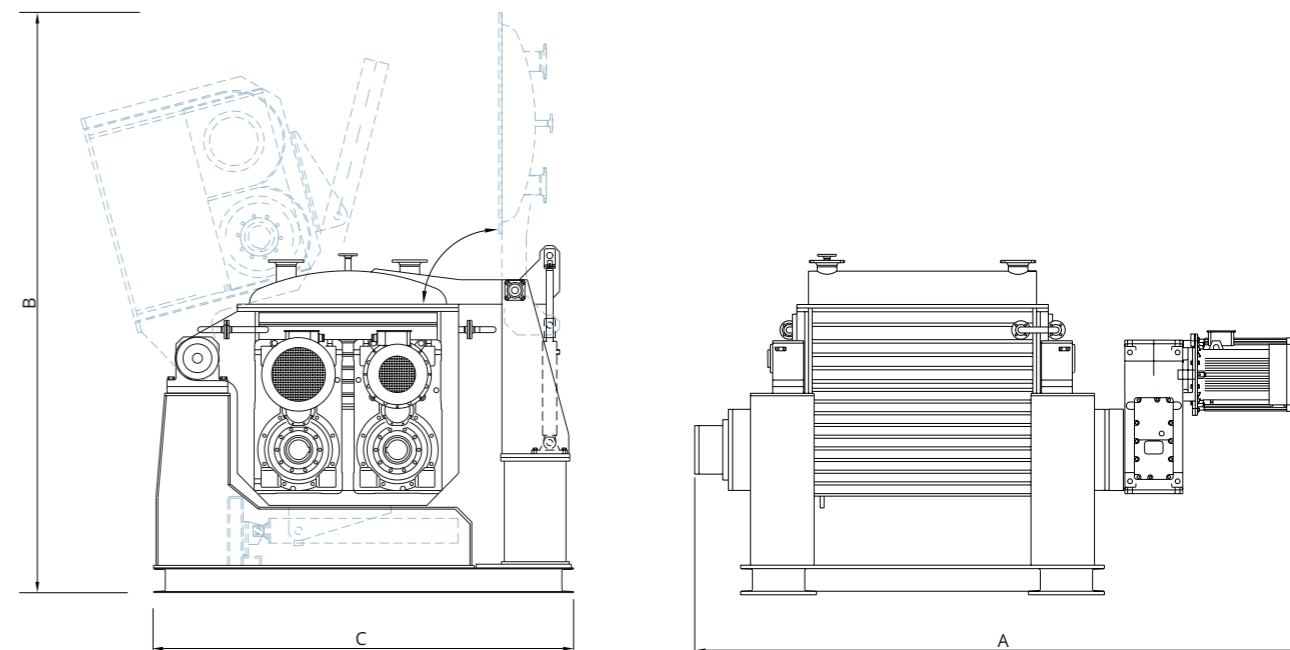
Detail of some internal pressurized stuffing boxes with inert gas to prevent product entry.

Hydraulic transmission is particularly suitable for applications requiring high intermittent stresses. This transmission provides advantages such as:

- » Continuous speed variation of blades and extruder, maintaining constant torque.
- » Safe response against abnormal increase in product viscosity.
- » Simplification in certification for working in explosive areas.



Technical Data



Model**	Volume		Blade power* (kW)	Dimensions (mm)		
	Useful	Total		A	B	C
AM-1,5	0.6	1.5	0.5 / 1.1	1,140	850	750
AM-2	1.5	2	0.5 / 1.1	1,200	800	750
AM-5	3.5	5	0.5 / 1.1	1,375	910	855
AM-25	15	25	4 / 3	1,330	945	1,135
AM-50	30	50	5,5 / 5,5	1,840	1,105	1,295
AM-150	90	150	7,5 / 7,5	2,182	1,450	1,492
AM-250	150	250	11 / 11	1,880	1,310	1,500
AM-400	240	400	15 / 15	3,000	1,650	1,645
AM-600	360	600	22 / 22	2,860	1,700	2,200
AM-1000	600	1,000	30 / 300	2,900	1,825	2,515
AM-2000	1,200	2,000	75 / 55	4,070	2,564	2,965
AM-3500	1,850	3,500	110 / 75	4,480	2,900	3,500
AM-5000	3,000	5,500	160 / 110	4,800	3,200	3,900

*The powers marked in this table are designed to work with products with a viscosity between 100,000-5,000,000 cP.

** On demand, it is possible to manufacture models with a larger product volume.