Our Innovation
Your Success

Double Shaft Paddle Mixer

CV ≤ 5%
within 30-180 seconds

Premixer

Premix Plant

www.larkenggco.com

SIGNIFICANCE OF MIXING

Mixing is one of the most important operations in manufacturing of animal feeds and mixer is considered to be the heart of feed milling operation.

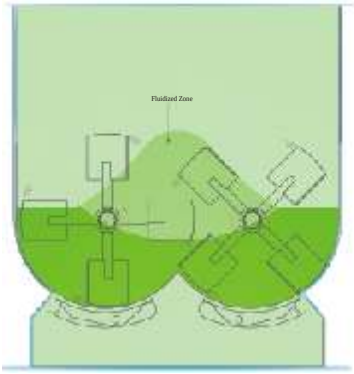
The need for uniformity in a complete feed is a must in order to satisfy nutritional requirements of the animal to achieve growth, production and good health .

Those associated with animal feed production realize that if feed ingredients particularly micro-ingredients such as vitamins, amino acids, trace elements and drugs are not properly blended, overall animal performance will be reduced and wide variation within the group of animals will exist. It is also possible to create a toxic situation if some ingredients are not properly mixed. Most feed additives, such as fat soluble vitamins, trace minerals, antibiotics and growth promoters will not perform their intended function if they are not properly blended in the feed.

Further, huge money is spent on storage, and semi automatic or fully automatic proportioning systems to deliver exact amounts of ingredients in a batch. However, if these ingredients are not properly mixed, the quality control system prior to mixer will loose its great deal of effectiveness.

The objective of mixing is to create a completely homogeneous blend. In other words, any sample taken should be identical in nutrient to any other sample. The value of homogeneous blend is very critical for small animals which consume very little feed as compare to large ones. For example a shrimp of 1 gm wt. will require 0.12 gm of feed per day and a day old chick will consume 6-8 gm feed at early stage. Accordingly, if a feed formulation has been properly mixed a 0.12 gm sample of shrimp feed and 6 gm sample of broiler pre starter feed should contain all the nutrients formulated for that diet. Conversely, the value of a homogenous blend for large animals is not as critical as they consume greater quantity of feed say 5 kg to 20 kg per day.

During the manufacture of feeds there are several factors which create or contribute to incomplete mixing. Some of these are related to the machine i.e. type of mixer, design of mixing elements and mixing parameters etc and some are related to the physical properties of the ingredients like particle size, particle shape, density, hygroscopicity, static charge and adhesiveness.

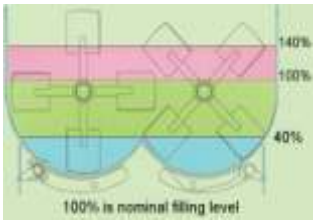


Working Principle

Technology

This machine is based on Weight less Zone or Fluidized Zone mixing technology with many modifications at Lark Engg. Co. (India). In this machine, two shafts are positioned in a double drum housing on which series of blades (generally 14 on each shaft) are fixed. The two shafts rotate at a specific peripheral speed in opposite direction while paddles on each shaft overlap in the middle of mixer.

This lift all the ingredients in the middle and creates fluidized zone by neutralizing gravitational forces working on particles of different ingredients having different shapes, sizes & density. Hence, a very homogeneous product is received. The next step is to discharge the highly homogenized material from the mixer without segregation. For this, material is discharged very quickly with the help of two pneumatically operated large bottom discharge doors.



Filling level

Filling level is another feature of this mixer, as it can work equally well with 40% overfilling and 60% under filling of its nominal filling level. Nominal filling level is the level upto the shaft of the mixer.

For liquid addition, material should be filled at least 120% level when pin-mill or FDB is used.


Liquid Addition System

Liquid Addition

The provision of single shaft with rotating pins positioned at the fluidized zone of the mixer is called Flow Distortion bar. The Flow Distortion Bar creates curtains of particles to which the liquid can be sprayed by providing a spray bar with nozzle arrangement. The dry materials encase the liquid droplets so that liquid can not be smear up inside of the mixer.


Mixing with Pin Mill System

Pin mill system

The pin mill system provision in fluidized zone of mixer consists of two counter rotating shaft with pins. When both the shafts are counter rotating through the fixed pins welded on the shroud on the top, they create the required shear force to break the soft lumps. Please note that to effectively use the Pin Mill system, you require to have 20% over filling of normal batch capacity.

Our Double Shaft Paddle Mixer has following strong points :

Mixing Quality

Homogeneous mixing of different ingredients irrespective of density, shape and size of ingredients in shortest time. CV< 5% is easily achievable within 30 sec. to 180 sec.

As per tests carried out at our factory with 100 gm of tracer in 1000kg of feed, a CV<5% is easily achievable within 45 secs.

Product Heating

Due to large particle movement in Fluidized Zone and a relatively low speed counter rotating shafts very low friction and shear forces are generated, hence heating as well as mechanical abrasion on product is greatly avoided which make it suitable for even for fragile products.

Economy of Mixing

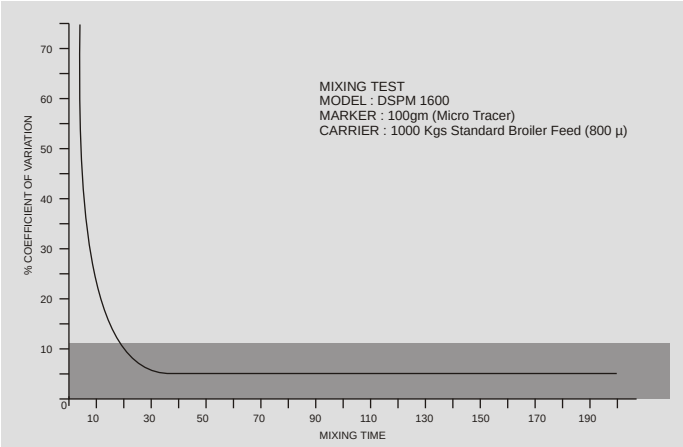
Power consumption per ton of the product mixed is very low. Similarly with negligible wear and tear, maintenance, running cost is also very low.

Segregation at Discharge

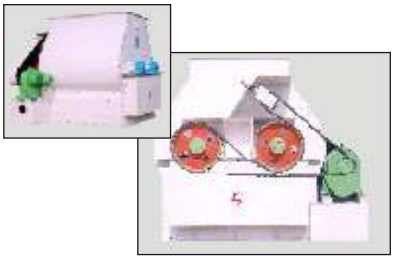
As the mixer is discharged quickly, segregation is greatly avoided and there is minimum of residue in mixer.

Cleaning

As there is minimum of residue after discharging in mixer and due to large access doors, cleaning is very easy.

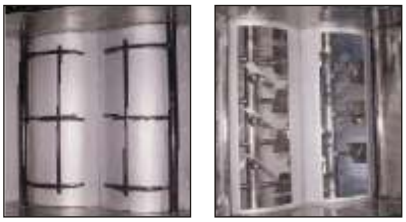


Special Features and Options



Standard mixer comes with a heavy duty multiple strand chain drive system with chain tensioner.

Close Open



Bottom View of Discharge Gates

Large Access Door:
Machine is provided with quick opening access doors on big size models for easy access to mixer inside for cleaning purpose. Doors are fitted with limit switches to provide lock out protection during operation.

Control Panel:

1. Fitted with a timer to select the desired mixing time, after which mixer automatically stops.
2. Control of pneumatically operated discharge

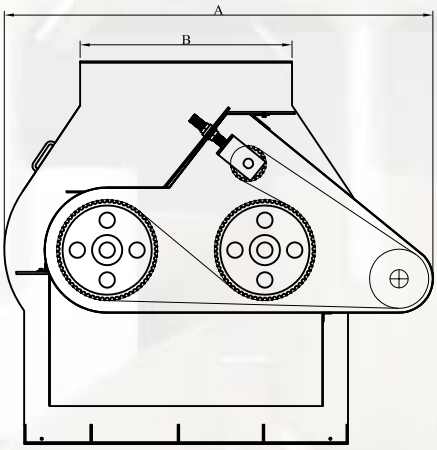
Bomb - bay Discharge Door :
The large twin full length or half length bomb bay door openings as desired are key to fast, efficient discharging, which avoid segregation of mixed product while discharging

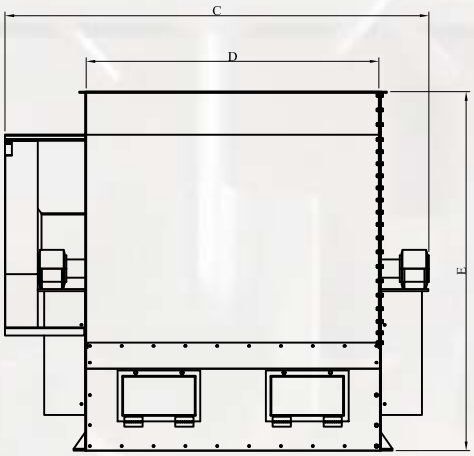
EFFECTIVE SHAFT SEALING SYSTEM

HOW PROPER MIXING IS ACHIEVED

Desired Features	Achieved by
1. For proper mixing each particle of minor ingredients should move in a controlled and organized way as compare to all other particles.	1. This is achieved by special dimensioning of drum and twin shaft design, greater surface area of paddles, special angles of paddles, no dead spots in mixer etc.
2. Mixer should be capable to overcome natural forces produced during mixing due to difference in particle shape, particle size and particle weight.	2. This is achieved in this machine by lifting the product at middle and selecting a particular peripheral speed to produce a weigh less condition of particles, it results homogenous mixing irrespective of particle shape & size.
3. Mixer should not heat up the mixing ingredients.	3. This is achieved by very gentle mixing due to double drum design and reverse angle of paddles at the sides.
4. Once the product is mixed, it should be discharged in a manner, so that there is minimal segregation at discharge. The terms segregation at discharge means the de-mixing of a proper mixed ration while discharging. It happens because when a mixer say capacity of 1000 kgs / batch is discharge slowly, as the quantity of ration in drum decrease, the turbulence of particles increase and in last part of discharging when say only 100 kg of ration is there in drum, it is segregated by centrifuged forces acting on these particles.	4. In this mixer, the segregation at discharge is very much avoided by discharging the mixer very quickly by full length large bottom doors.

Technical Specifications & Dimensions





Model	Batch Capacity		Power in H.P	Dimensions				
	Ltr	Cu.ft		A	B	C	D	E
DSPM -60	60	2.1	3	900	690	980	580	650
DSPM -120	120	3.5	5	1110	850	1210	730	950
DSPM -150	150	5.3	5	1220	960	1260	790	980
DSPM -200	200	7.1	5	1350	1050	1350	840	980
DSPM -350	350	12.4	7.5	1650	1240	1500	995	1150
DSPM -500	500	17.7	10	1750	1370	1640	1150	1180
DSPM -750	750	26.5	15	1950	850	1860	1300	1500
DSPM -1000	1000	35.3	20	2200	900	2060	1450	1560
DSPM -1600	1600	56.0	30	2550	1030	2400	1650	1750
DSPM -2000	2000	70.0	40	2850	1150	2600	1890	2100

Note: The given batch capacity is for normal filling upto shaft level. This machine can work on 40% over filling and 60% under filling of normal filling level.

Lark Engineering Co. (India)

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