



Jas Enterprises  
An ISO 9001:2008 Certified Company  
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<http://www.jasenterprise.com> or <http://www.pulveriser.co.in> or <http://www.pulverizerindia.com>

## Mini dal mill

Avail from us, our range of mini dal mills is use for making carrying different processes cleaning and grading, pitting, pre-treatment with oil & water, conditioning, de- husking & splitting. The various advantages of these mini dal mills are:

- Value addition of the product
- Cost of transportation saved
- Additional income through sale of seed coats as cattle feed
- Improved yield of 'dal' due to use of improved milling technology
- Easier operation & less maintenance cost construction



Jas enterprises offer mini dal mill. This mill is simple in construction and easy to operate & maintain. It consist of horizontal tapered roller is covered with emery coating, surrounded by a screen through which the husk is discharged. The shelled dal passes through an aspirating fan on the oscillating sieve unit, where appropriate grading of dal is done it is run on only 2 H.P. Automatic arrangement are made for collection of de husked and split dal , un de husked and split dal , un de husked dal , brackens, husk in separate containers and bags. This machine offers dust free operation, does not cause pollution, retains proteins, natural shine etc ... Motor is provide with a pulley and is mount at the bottom of the stand with v-belt to drive it. The motor requirement is of 2 hp single / three phases.

## Key features of mini dal mill

- Unique and reliable design
- The mini dal mill is highly effective as well as nonstop continuous pulverizing process.
- Easier operation & less maintenance cost.
- Retains proteins.
- Compact size (length 1650 mm x width 900 mm x height 1350 mm)

## Construction of dal mill

This mini dal mill is simple in castration & easy to operate & maintains. It consists of horizontal tapered roller the roller is covered with emery coating surrounded by screen through which husk powder is discharged. The shelled dals pass through aspirating fan on oscillating sieve unit where appropriate grading of dals is done. The vibratory sieves are provided with different size holes to match the requirements of the type of dal being processed. The vibrations are included b a cam operated link



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which is mounted on a counter shaft (motor derived shaft) with these mini dal mill Jas enterprises is provided paddle type screw mixer in all mild steel construction with worm shaft.

## Operating principle of dal mill

Process of de-husking is doing in two major steps. In the first step the cleaned and size graded grain are scarify followed by oil addition and sun / mechanical drying. In the second step, the removal of husk and splitting into two cotyledons is doing by passing the material through versatile dal de-husker. This de-husker gives 2-4% higher yield of good quality dal, than the traditional dal mill. This method developed by Jas enterprises is less laborious, requires less time and reduces losses during de-husking. One of these methods developed and ready for commercialization is 'mini dal mill'. The technical up gradation & cost economics of the 'mini dal mill combined with facilities of grader cum cleaner can prove to be a boon to the farmers. This unit installed near the farm itself. Process on dal mill cleaning and grading: this unit consists of a vibratory inclined sieve, hopper, grain collector, waste collector and motor. The vibratory sieves are providing with different size holes to match the requirements of the type of dal being process. The vibrations are inducing by a cam-operated link, which is mounts on a motor driven shaft.

### Pitting process for mini dal mill

An emery roller machine is use to obtain cracking and scratching of clean dal passing through it. For loosening, the husk to facilitate the subsequent oil penetration this is required. Gradually the clearance between the emery roller and cage (housing) is narrow from inlet to outlet. Cracking and scratching of husk takes place mainly by friction between dal and emery as the material is passing through the narrowing clearance. During the operation, some of the dal is de-husk and split which are separate by sieving.

### Pretreatment with oil & water for dal mill

A screw conveyor allows passing the scratched or spitted material through it and mixing of some edible oil like linseed oil is complete. The linseed oil is use at the rate of 1.5 to 2.5 kg/tones of dal. These are keeping on floors for about 12 hours to diffuse the oil.

### Conditioning with mini dal mill

Dals are condition by alternate wetting and drying. Moisture (3.5%) is adding to the dal after sun drying for a certain period and tempering is doing for about eight hours. The grain is dry in the sun again. By allowing water to drop from an overhead tank on the dal, which are passing through the screw conveyor addition of moisture to the dal, are achieving. Until all dal are sufficiently conditioned the wholes process of alternate wetting and drying is continued for two to four days. Dals are finally dry to about 10 to 12% moisture content.

### De-husking and splitting with mini dal mill

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Developed and Managed by Jas Enterprises



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For de-husking of conditioned dal emery rollers called as gota machine are used. In one pass or single operation, about 50% of dals are de-husked. De-husked dals are splitting into two parts. De-husked split dals are separate by sieving and the husk is aspirate off. Un-split de-husked dal and tail dal are again de-husk and milled in a similar way. Until the running dal are de-husked and split of the wholes process is repeated two or three time.

### Pre milling of dal

To obtain best results during de-husking and splitting of dal in the dal de husking machine in Jas brand mini dal mills, latest model improved version, pre milling including grading of dal size wise is very essential. The raw dal is first clean of dust, chaff, stones and other extraneous materials. Sieves grade cleaned dal or dal graded and soaked in water in cement's tanks having 6" depth. Height of dal soaked is 5" and the water level should be 1" above the dal. Soak dal are taken out of the water after specific time and put on the sieve. Swollen dals which do not pass through sieve (from which un-swollen dal earlier passed through the same) are ready for heaping in shade whereas the dal which pass through the same sieves. Then these dals are ready for heaping in shade. Degree of happing of swollen dal in shade should be 30 to 40. This process should be continuing until the dal is swill to the desired extent. There after the dal are in thin layers in the open sun drying. Duration of sun drying of dal vary according to weather condition prevailing at the time of processing. After sun drying, the dal is again heap in shade so moisture contents in the dal may become uniform as need in them for de-husking. Then the dal are graded again fed in to the dal de husking machine in Jas mini dal mill in graded lots to achieve he best results with minimum brokenness. For the guidance of the entrepreneurs, the process of details of pre-milling of dal after proper cleaning is show here after in a tabulated chart.

### Note: -

- Period of soaking in water will vary according to weather condition and quality of pulses (dal).
- Duration of sun drying will vary according to weather condition.
- Pulses (dal) should not be warm at the time of de-husking/splitting.
- Pulses (dal) should be de-husk and split in graded lots only.
- Pulses (dal) shown at one & two must be dry within 3 days to get better results. Their processing in any season should be avoiding.
- The de-husked pulses (dal) mixed with the un-husked pulses (dal) and the husks are again de-husked in the Jas brand mini dal mill as usual. In second pass all, the pulses (dal) are de-husked.

### Construction of mini dal mill

Sr.	Name(s) of	Pretreatment	Period of	Duration	Period of	Percentage of	Size grinding for
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No.	pulses ( dal )	with oil	heaping in shade	of sun drying	heaping in shade	moisture for splitting needed for splitting & de-husking	De-husking & splitting	Splitting only
1.	2.	3.	4.	5.	6.	7.	8.	9.
1.	Bengal grams (chana) (chick-pea)	Soaking in water for 30 to 40 minutes	1 hour.	2 to 3 days	6 to 8 hours.	10 to 12%	Needed	No needed
2.	Arhar/tur/ pigeon peas/ red grams	Soaking in water for 60 to 90 minutes	3 hour.	2 to 3 days	6 to 8 hours.	11 to 12%	Needed	No needed
3a.	Masoor (lentil) fresh crop before rains	Lots of 100 kg. Of pulses ( dal ) to be mixed in 5 kg. Of water	To be kept for 10 to 11 hours under dry sacks	No needed	No needed	10 to 12%	Needed	No needed
3b.	Masoor (lentil) fresh crop after rains	To sprinkle water to get the desired moisture	To be kept for 10 to 11 hours under dry sacks	No needed	No needed	10 to 12%	Needed	No needed
4a.	Khesari fresh crop before rains	Lot of 100 kg. Of pulses ( dal ) to be mixed in 5 kg. Of water	To be kept for 10 to 11 hours under dry sacks	No needed	No needed	10 to 12%	Needed	No needed
4b.	Khesari fresh crop after rains	To sprinkle water to get the desired moisture	To be kept for 10 to 11 hours under dry sacks	No needed	No needed	10 to 12%	Needed	No needed



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5a.	Mung (green grams) fresh crop before rains	Lot of 100 kg. Of pulses ( dal ) to be mixed in 5 kg. Of water	To be kept for 10 to 11 hours under dry sacks	No needed	No needed	10 to 12%	Needed	No needed
5b.	Mung (green grams) fresh crop after rains	To sprinkle water to get the desired moisture	To be kept for 10 to 11 hours under dry sacks	No needed	No needed	10 to 12%	Needed	No needed
6a.	Urid (black grams) fresh crops before rains	Lot of 100 kg. Of pulses ( dal ) to be mixed in 5 kg. Of water	To be kept for 10 to 11 hours under dry sacks	No needed	No needed	10 to 12%	Needed	No needed
6b.	Urid (black grams) fresh crops after rains	To sprinkle water to get the desired moisture	To be kept for 10 to 11 hours under dry sacks	No needed	No needed	10 to 12%	Needed	No needed

Further process details of pulses (dal) at sr.nos.5a, 5b, 6a & 6b moong (green grams) & urid (black grams)

Oil treatment	Period heaping in shade	Sun drying	Heaping in shade	De-husking
10	11	12	13	14
100 kg.(220.462 lb) of split pulses ( dal ) to be massaged by 200 grams of edible oil, grade wise	5 to 6 hours	2 to 4 days	6 to 7 hours	Needed



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### Standard accessories of mini dal mill

- Motor pulley.
- Adjustable rail for fixing motor.

### Extra accessories of mini dal mill

- 2 H.P. (1.5 kw) 4 pole totally enclosed fan cooled three phase or single phase sq. Cage motor as per is: 325 or 996. (electricity (special power can be accommodated): 110/220/380/415 volts, 50 Hz ,1/3 phase }
- Suitable miniature circuit breaker as per is: 8828 with 3 meter cable & 3 pin top as per is: 1293 for single phase electric motors.
- Starters, main switch, ampere meter, capacitor for single phase electric motor.
- Foundation bolts
- V belts
- Magnetic hopper
- "Jas" brand dal ( pulse ) polisher machine

### De husking and splitting of pre-conditioned dal ( grams ) per hour

Bengal grams ( channa ) bokla,	150 to 180 kg. Per hour
Kesari, matar ( peas) soya bean	150 to 180 kg. Per hour
Pigeon pea ( read grams, arhuar, tur )	125 to 160 kg. Per hour
Lentil ( mansoor )	125 to 160 kg. Per hour
Black gram ( urad)	80 to 100 kg. Per hour
Green gram (moong) moth bean	80 to 100 kg. Per hour