WHOLE WHEAT FLOUR
PESA ATTA

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Atta Process
Indian Atta Flour

- "Whole wheat flour" with 95 – 97% extraction.
- Used for flat bread (Chapatti, Roti, Puri, etc.)
- After rice, flat bread made from Atta is the second staple food in India.
- Traditionally produced on stone mills with low throughput.
India – large market of whole wheat flour (Atta).

Home made Atta Flour

Road side Atta Flour from stone mills or disk mills

Industrial stone (Chakki) mills
Industrial ATTA flour production in India

**Chakki mills in parallel → Premium ATTA**
Produced mainly in India and few other countries
Major Players for Premium ATTA in India:
ITC Ltd. (Aashirvaad), Hindustan Lever Ltd (Anapurna), General mills (Pilsbury ATTA)

**Roller mill → Normal, Resultant ATTA**
Produced in East Asia, Arab countries, India. partly Africa, even Europe
Of minor quality in final product (Chapati)
Market demand

- Atta flour production for staple food in India
- Meeting local eating habits
- **FOOD SAFETY** - flour production
- Industrial process with higher automation degree
- Lower energy consumption compared to stone mills
Innovative Grinding Technology.

Pesa mill is the key grinding components for whole wheat atta process. The typical flour characteristics for flat breads (roti, chapati), such as starch damage and water absorption, can be flexibly controlled.
Atta Process with PesaMill™.
Traditional flat breads made of whole meal flour.

Chapati

Roti

Puri

Gurassah / Sudan
Innovations in Atta Milling
Hygienic Atta for good health

- Top sanitation
- Energy saving
- Flexibility in Atta quality
- Low maintenance demand
- Homogeneous and consistent product
- Space saving
- Less down time while power cuts
- No stones shavings in Atta
Process function

- Re-circulation process (4 - 5 times). Important to reach certain temperature and specific degree of starch damage
- Regulated wheat input
- Atta flour is separated in plansifter & bran finisher
- Bran is removed by AirEco sifters and bran finishers
- Roller mill supports grinding and increases flexibility of process
Pneumatic Variant

- Another forward leap in the process..
- For high hygiene standards
- Better sieving efficiency
Pesa-Mill™ MDGA – the heart of the process

- Recirculation process: Reduction of the particle size is achieved in multiple cycles
- Simultaneous grinding of wheat and intermediate products
- MDGA-400 A - 150t/24h Atta
- MDGA-200 A - 65t/24h Atta

Predominant stress: Compression
AirEco Sifter MTZA

- Separates product into two fractions of different density
- Gives flexibility in regulating final yield
- Low energy consumption compared to purifiers due to air recycling system
- Specifically designed for the Atta Process and the CombiMill Process
- AirEco Sifters do not replace purifiers. It is not possible to produce clean semolina.
Quality parameters of whole wheat flour for flat bread.

**Quality parameters**
- Granulation
- Starch damage
- Higher water absorption
- Moisture content, elasticity
- Long shelf life
- Hygiene, food safety

**Organoleptic parameters**
- Smell
- Taste
- Texture/ appearance of flat bread
Quality figures for Indian Atta flour.

Results from Bühler Atta process with PesaMill™.

<table>
<thead>
<tr>
<th>Process parameter</th>
<th>min.</th>
<th>max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damaged starch AACC [%]</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>Water absorption [%]</td>
<td>75</td>
<td>79</td>
</tr>
</tbody>
</table>

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</tr>
</thead>
<tbody>
<tr>
<td>Starch Damage AACC [%]</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>Water uptake [%] dry base</td>
<td>70</td>
<td>80</td>
</tr>
<tr>
<td>End moisture[%]</td>
<td>9</td>
<td>10.5</td>
</tr>
<tr>
<td>Temperature [°C] in Process</td>
<td>50</td>
<td>67</td>
</tr>
<tr>
<td>Granulation</td>
<td>50% - 65% &lt;118µm</td>
<td></td>
</tr>
<tr>
<td>Extraction [%]</td>
<td>93</td>
<td>96</td>
</tr>
</tbody>
</table>
Customer benefits compared to Chakki mills

- Same flour quality as Chakki mills
- Energy saving → up to 10%
- Higher yield → up to 1 – 1.5%
- High sanitation → stone-less grinding system allows high end product quality
- Low maintenance → no redressing of stones needed
- Reliable operation → consistent end product quality
- Lesser foot-print of the plant
One Pesa Mill replace 20 Chakki Mills.

- Flexible process
- Top sanitation
- Low maintenance demand
## AlPesa Specifications

<table>
<thead>
<tr>
<th>Details</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Footprint (L x B x H)</td>
<td>5.2 x 4 x 6 m</td>
</tr>
<tr>
<td>Installed power</td>
<td>70 kW</td>
</tr>
<tr>
<td>Capacity</td>
<td>750 Kg per hr</td>
</tr>
<tr>
<td>Power consumption</td>
<td>72-75 kW per ton</td>
</tr>
</tbody>
</table>

### Buhler Scope vs. Customer Scope

<table>
<thead>
<tr>
<th>Buhler Scope</th>
<th>Customer Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Feeding Module</td>
<td>Cleaned Wheat</td>
</tr>
<tr>
<td>2. Grinding Module</td>
<td>Incoming power cable up to panel</td>
</tr>
<tr>
<td>3. Sifting Module</td>
<td>Exhaust duct from fan</td>
</tr>
<tr>
<td>4. Filter Module</td>
<td></td>
</tr>
<tr>
<td>5. Pneumatics Module</td>
<td></td>
</tr>
<tr>
<td>6. Control Panel Module</td>
<td></td>
</tr>
</tbody>
</table>
PesaMill™ Reference Plants.
Proven technology.
High Extraction Flour and Whole Wheat ATTA Flour

- Option to produce conventional flour or Whole wheat Flour in the same line.
- Better plant utilization.
- Higher yield in conventional flour up to 85%+ with 0.9% ash (suitable for Biscuit, Brown bread, Arabic bread flour & Aqua feed etc.)
- High Quality ATTA flour (i.e. Roti, Chapatti, Puri etc.)
- High sanitation → stone-less grinding system allows high end product quality
- Reliable operation → consistent end product quality
- Lesser foot-print of the plant
Hygienic Atta for good health and happiness!!