advanced
technologies
- worldwide

BMA
New approach to sugar drying and cooling

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Albuquerque, New Mexico
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BMA AG
New approach to sugar drying and cooling

- **Importance of sugar drying & cooling**

- **Well-established solutions**

- **Challenges**

- **The new VFC – Vertical Fluidized bed Conditioner**
Importance of sugar drying & cooling

**Required results**

- **Max. residual moisture content:** 0.03 % - 0.04%
- **Max. storage temperature:** 25 to 40 °C / 77 to 104°F
- **No sugar lumps**
Importance of sugar drying & cooling
Process kinetics

- **2 simultaneous processes:**
  - Evaporating water
  - Crystallizing sugar

- **Conditioning phase during the first few days after production**

- **Loss of water-binding properties**

- **Solution: slow drying combined with gentle movement**
Well-established Solutions

- **Drum dryer & cooler**
  - Reliable and sturdy
  - Limited cooling effect

- **Drum dryer & cooler with air conditioning system**
  - Increased cooling effect
  - Constant inlet air temperature
  - Relatively high energy requirements
Well-established Solutions

- **Drum dryer & cooler with additional fluidized bed conditioner**
  
  - Excellent heat transfer characteristics
  - Constant sugar outlet temperature
  - Additional drying properties
  - Gentle sugar treatment

- **Drum dryer & cooler with additional fluidized bed conditioner and operated with conditioned cooling air**
  
  - Applicable even under extreme incoming air conditions
Fluidized bed unit
with integrated cooling surfaces
Challenges

- **Expansion**
  - Higher capacities
  - Limited space available

- **Energy savings**
  - Costs
  - Legal requirements

- **Sugar quality**
  - Storage
  - Transportation

- **Climatic conditions**
  - Cooling & dehumidifying of inlet air
VFC – Vertical Fluidized Bed Conditioner (I)
VFC – Vertical Fluidized Bed Conditioner (II)

- **Excellent heat transfer**
  Fluidized bed technology

- **Little air consumption**
  Vertical arrangement of heat exchangers
  Product flow by gravity

- **Energy savings**
  Efficient air cooling & dehumidifying
  Intelligent re-feed of air into drum dryer

- **Small footprint**
  2.000 x 1.800mm / 78.74 x 70.86”
VFC – Vertical Fluidized Bed Conditioner (III)

- Constant sugar outlet temperature
- High throughput
  Up to 100mt/h
- Mass transfer
  Additional drying capability
- Suited for installation in tropical climate
- Low maintenance
# Dimensions of the VFC-series

<table>
<thead>
<tr>
<th>VFC Series</th>
<th>Width</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.000 mm / 78.7”</td>
<td>1.800 mm / 70.9”</td>
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</table>

**Total height**

<table>
<thead>
<tr>
<th>VFC Series</th>
<th>Total Height</th>
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<tbody>
<tr>
<td>VFC 16/2</td>
<td>5.360 mm / 211.1”</td>
</tr>
<tr>
<td>VFC 16/3</td>
<td>6.320 mm / 248.8”</td>
</tr>
<tr>
<td>VFC 16/4</td>
<td>7.280 mm / 286.6”</td>
</tr>
<tr>
<td>VFC 16/5</td>
<td>8.240 mm / 324.4”</td>
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</table>
VFC – Vertical Fluidized Bed Conditioner
Principle of sugar flow
VFC – Vertical Fluidized Bed Conditioner
Principle of sugar flow
VFC – Vertical Fluidized Bed Conditioner
Air distribution and discharge plate

- Heat exchanger
- Non-movable part
- Movable part
- Support
- Pneumatic cylinder
VFC – Vertical Fluidized Bed Conditioner
Air distribution and discharge plate

Non-movable part

Movable part

Pneumatic actuation
Internal Heat Exchanger

- Well-proven standard unit
- Modular design
Fluidized or Airless Moving Column System?

Heat transfer rate is 3 to 4 times higher with Fluidization
VFC – Vertical Fluidized Bed Conditioner

Result of constant development focused on

- Sugar quality in terms of residual moisture
- Reduction of unit size and the demand for process air by introducing water-cooled heat transfer units to the product compartment.
- Changing from horizontal to vertical design
VFC – Vertical Fluidized Bed Conditioner
The solution…

- … in new factories
- … for production increase in existing facilities
- … as standalone solution between curing and loading
Thank you for your kind attention!