IAOM Flour City District Meeting
August 9, 2018
THE BEGINNING

- Founded in 1964 in Des Moines, Iowa by Ken and Ann Bratney.
- Began business in seed, grain, and food related industries with commitment and respect for the relationship with the customer.
- Focus on equipment sales and design. Quickly grew to include engineering and construction services by the mid 1970’s, and today includes milling and manufacturing services.
- Ken Bratney: “Your word is your bond.”
- We live by this motto even today
Today

• Full service company with more than 145 full time employees with office locations in:
  – Des Moines, Iowa (corporate office)
  – Fargo, North Dakota
  – Boise, Idaho
  – Kansas City, Missouri
  – Sacramento, California
  – Colon, Argentina

• Primary Area of Coverage:
  – United States
  – Argentina, Uruguay and Brazil

• Disciplines:
  – Process Equipment Sales
  – Design / Engineering / Construction Services
  – After Sales Service and Support
DIVERSE APPLICATIONS

- Wheat seed conditioning plants
- Export wheat cleaning facilities
- Malting Plants for Breweries
- Edible bean conditioning
- Feed Mills
- Hybrid Seed Corn plants
- Native and lawn grass seed plants
- Oat mills
- Grain & process drying facilities
- Edible corn conditioning
- Green coffee bean conditioning
- Popcorn conditioning facility

EXTENSIVE EXPERIENCE

- Rice Milling Systems
- Soybeans – seed, edible & organic
- Breweries – malt storage systems
- Bird Food Plants
- Flour mills
- Hop pelleting plants
- Spice cleaning and blending
- Packaging all types of free flowing materials
- Split pea processing
- Sunflower processing plants
- Almond sizing
- Salt and specialty minerals
ENGINEERING AND DESIGN SERVICES

- Design Build Services
- Plant/Equipment Layout
- Process and Material Handling
- Civil/Structural/Mechanical
- 3D Computer Aided Design (AutoCAD & SolidWorks)
- Scheduling and Coordination
- Startup and Commissioning
- Manuals – O&M, Safety, Quality
- As-Built Documents
CONSTRUCTION SERVICES

- Construction Managers (2)
- Millwright Superintendents and Crews (8 crews)
- Fully Equipped Concrete Crews (1 crews)
- Work schedule 10 days on and 4 days off.
- Site Superintendents have an average of 20+ years of experience.
- Millwright Subcontractors – Bratney Approved
CUSTOM EQUIPMENT

• A Bratney Company
• Developed to fill the role of developing solutions for our clients that manufacturers would not pursue.
• Utilize our resources to work with existing and new partners to develop and integrate a value added solution.
ITALIAN EXCELLENCE

PERFORMANCE
EVOLUTION
IN THE ART
OF MILLING
Founded in 1966. Over 50 years of milling experience.
More than 60 milling plants worldwide.
2 manufacturing facilities in Italy.
Manufacturing and innovation is their passion.
Most innovative milling technologies in the market.
FACILITIES: August 2015

• 11,000 m² (118,000 ft²) total.
• 1,800 m² (19,000 ft²) of new offices and meeting rooms
• New manufacturing facilities
• New test facility inside the factory for testing new technology and new machines
• Quality and testing laboratory, with new instruments
KEY CONCEPTS

OMAS TORQUE MOTORS
- High and steady torque at any speed (in a range from 0 to 550 RPM)

ASYNCHRONOUS MOTORS (CONVENTIONAL)
- Nominal torque only within a very narrow range of speed
## KEY CONCEPTS

<table>
<thead>
<tr>
<th>OMAS TORQUE MOTORS</th>
<th>ASYNCHRONOUS MOTORS (CONVENTIONAL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Have low consumption when not grinding: 0.8-1.0 A</td>
<td>• Consume 45% of nominal value in empty condition, corresponding to 13.5 A</td>
</tr>
<tr>
<td>• Are able to generate electrical current, thus energy, if decelerated or used as dynamo since they are permanent magnet synchronous motors</td>
<td>• Are damaged if used as generators;</td>
</tr>
<tr>
<td>• Can be overloaded over the nominal values, even for an indefinite period, if cooled</td>
<td>• Tolerate only the short-time overloading</td>
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</table>
## KEY CONCEPTS

<table>
<thead>
<tr>
<th>LEONARDO S ROLLER MILL OMAS</th>
<th>BELT DRIVEN ROLLER MILL (CONVENTIONAL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 <strong>TORQUE</strong> motors for every milling passage, 1 on each roll.</td>
<td>1 motor for every milling passage with 2 belt transmissions</td>
</tr>
<tr>
<td>Variable speed</td>
<td>Fixed speed</td>
</tr>
<tr>
<td>Vary differential as needed and automatically, with no downtime</td>
<td>Fixed speed ratio, unless pulleys and toothed belts are replaced</td>
</tr>
<tr>
<td>Possible to make the front or back roll the fast roll</td>
<td>Fixed setting: the front roll is always the fast one</td>
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</tbody>
</table>
OMAS - ENERGY SAVING

During operation in empty condition, every motor uses all the energy provided by the power supply; the two electric currents, passing through every drive unit, are exactly those required by the respective motor and have the same sign. So the total current supplied by the electric box is the sum of the two.

When engaged, during the milling phase, the slow motor generates an electric current toward the drive circuit, where it is directly used by the fast motor; this immediately reduces the electrical network power absorption, obtaining:

ENERGY SAVINGS
ENERGY SAVING

CONVENTIONAL ROLLER MILL

TOTAL ABSORBED CURRENT

Grinding Consumption

Fast motor

Slow Motor
ENERGY SAVING

Fig. 03 LEONARDO POWER

Power Required by the Fast Motor

Total Power

Grinding Power

Slow motor power output
# Kazakhstan Mill 160 Mton/Day

<table>
<thead>
<tr>
<th></th>
<th>MOTORS</th>
<th>KERS</th>
<th>NETWORK</th>
<th>MOTORS</th>
<th>KERS</th>
<th>NETWORK</th>
<th>TRADITIONAL</th>
<th>BELT</th>
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<tr>
<td></td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>kW</td>
<td>kW</td>
<td>kW</td>
<td>A</td>
<td>kW</td>
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<td>17,0</td>
<td>16,8</td>
<td>19,28</td>
<td>11,19</td>
<td>11,06</td>
<td>44,0</td>
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<td>B2</td>
<td>20,1</td>
<td>14,9</td>
<td>16,7</td>
<td>13,23</td>
<td>9,81</td>
<td>10,99</td>
<td>42,0</td>
<td>27,64</td>
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<tr>
<td>R1G</td>
<td>16,7</td>
<td>11,3</td>
<td>9,7</td>
<td>10,99</td>
<td>7,44</td>
<td>6,38</td>
<td>32,0</td>
<td>21,06</td>
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<tr>
<td>R1GA</td>
<td>26,7</td>
<td>19,6</td>
<td>8,5</td>
<td>17,57</td>
<td>12,90</td>
<td>5,59</td>
<td>30,0</td>
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<td>9,5</td>
<td>11,98</td>
<td>8,42</td>
<td>6,25</td>
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<td>9,7</td>
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<td>8,69</td>
<td>6,38</td>
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<td>12,51</td>
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<td>21,2</td>
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<td>6,3</td>
<td>7,24</td>
<td>4,87</td>
<td>4,15</td>
<td>15,0</td>
<td>9,87</td>
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<tr>
<td>C4</td>
<td>13,9</td>
<td>10,4</td>
<td>7,0</td>
<td>9,15</td>
<td>6,85</td>
<td>4,61</td>
<td>15,0</td>
<td>9,87</td>
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<tr>
<td>C5</td>
<td>13,9</td>
<td>10,4</td>
<td>7,2</td>
<td>9,15</td>
<td>6,85</td>
<td>4,74</td>
<td>15,0</td>
<td>9,87</td>
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<tr>
<td>C6</td>
<td>13,6</td>
<td>10,2</td>
<td>7,0</td>
<td>8,95</td>
<td>6,71</td>
<td>4,61</td>
<td>15,0</td>
<td>9,87</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>229,8</strong></td>
<td><strong>163,2</strong></td>
<td><strong>115,8</strong></td>
<td><strong>151,25</strong></td>
<td><strong>107,41</strong></td>
<td><strong>76,22</strong></td>
<td><strong>304,0</strong></td>
<td><strong>200,09</strong></td>
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</table>

**Difference:** -61,91%
Omas Pressure System - OPS

- Dynamic pressure measurement system.
- Quantitative measurement displayed on PLC.
- System uses information to adjust feed rolls in accordance with inlet product level.
OMAS DRIVE SYSTEM

Traditional manual driving system

Revolutionary driving system
PLANSIFTER PL “Galileo”
PLANSIFTER “Galileo”

- More efficient due to torque motor efficiency.
- No loss of energy through mechanical transmission.
- No maintenance required on drive mechanism.
- Motor mounted directly to the top of the sifter.
PLANSIFTER “Galileo”
New Patented Sieves

• Sieves and sieve supports made entirely of Nylon PA 66.

• Safe material, suitable for product contact in food applications.

• Light, durable, and holds up to mechanical stress.
WHEAT STERILIZER “Giotto”:
WHEAT STERILIZER “Giotto”

- Equipped with 150 adjustable paddles.
- Removes superficial bacteria, mold and mycotoxins.
- Reduces tempering time.
- Reduces ash content in flour.
WHEAT STERILIZER “Giotto”:
WHEAT DECORTICATOR “Dante”:

- 8 abrasive stones
- Adjustable actuator
- Cooling Fan
OMAS/BRATNEY FLOUR MILL

- Bratney engineering, construction, and installation.
- Omas equipment, mill design, and milling expertise.
- Start-up in Spring of 2019.
New Plants under construction
2018/2019

• 300 Mton/Day Angola Soft Wheat
• 160 Mton/Day Soft and Hard Wheat Uganda
• 2 x 300 Mton/Day Soft Wheat Benin
• 450 Mton/Day Soft and Hard Wheat Ghana
• 160 Mton/Day Soft and Hard Wheat Pennsylvania
• 160 Mton/Day Maize Argentina
• 160 Mton/Day Soft Wheat United Kingdom
• 110 Mton/Day Durum Italy
SUPERIOR PACKAGING EQUIPMENT

Complete Packaging Systems for Soft and Hard Pack Goods Including:

• Bagging Scales
• Bag Hangers
• Hybrid and Robotic Palletizing Systems
BoMill – NIR Seed/Kernel Sorting for Protein, Vomitoxin, and Vitreous Qualities

**Model IQ Lab Unit**
- 5 Pounds/Hour
- 6 Quality Fractions

**Model Tri-Q Production Unit**
- Approx. 3 Metric Tons/Hour
- 3 Quality Fractions
SORTING PRINCIPLES

Sort Barley, Oats, Wheat or Durum by Internal Properties:
- Relative Protein Content
- Kernel Hardness (vitreous qualities)
- Vomitoxin (DON / Fusarium / Other Mycotoxins)
BoMill

BOMILL MODEL IQ SORTING REPORT

SAMPLE DETAILS
Grain: Hard Red Winter Wheat
Customer: 
Sorting Parameter: Protein
Protein Reference: 12.5%
DON in Reference: 3.0ppm

Date: 7/6/2018

<table>
<thead>
<tr>
<th></th>
<th>Incoming Grain (lbs)</th>
<th>Control Sample (lbs)</th>
<th>Sorted Sample (lbs)</th>
<th>Cleaning &lt; 5.5/64 slot; &gt; 12 Rd (lbs)</th>
<th>Cleaned Sample (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7.54</td>
<td>0</td>
<td>7.54</td>
<td>0.21</td>
<td>7.33</td>
</tr>
</tbody>
</table>

Air/Screen Cleaner

Test sample

Fractions F1 - F6

### SORTED FRACTIONS

<table>
<thead>
<tr>
<th></th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>F5</th>
<th>F6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (lbs)</td>
<td>1.48</td>
<td>1.24</td>
<td>1.17</td>
<td>1.20</td>
<td>1.20</td>
<td>1.04</td>
</tr>
<tr>
<td>Yield (%)</td>
<td>20.2</td>
<td>16.9</td>
<td>16.0</td>
<td>16.4</td>
<td>16.4</td>
<td>14.2</td>
</tr>
<tr>
<td>Protein (%)</td>
<td>11.2</td>
<td>11.9</td>
<td>12.4</td>
<td>12.7</td>
<td>13.2</td>
<td>13.5</td>
</tr>
<tr>
<td>DON (ppm)</td>
<td>17.5</td>
<td>1.6</td>
<td>0.7</td>
<td>0.4</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Germination (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• Air/Screen Grain Cleaners and Graders
• Indent Cylinder Length Sizers
• Gravity Tables and De-Stoners
• Grain Driers
• Optical Sorters
• Retractable Loading Spouts
PROCESSING  EQUIPMENT

- 270 mm (10.6”) chute width.
- True full color RGB cameras with .06mm resolution.
- NIR and InGaAs camera options.
- Up to 4 cameras per chute.
- Available from 1 to 7 chutes.
- Bratney service and support.
THANK YOU