BONFIGLIOLI SOLUTIONS FOR SUGAR CANE MILL PLANTS

Sugar cane is becoming more and more important and the industry attracting ever greater interest as a result of increased global demand for food grade sugar and the growing use of ethanol as an alternative to fossil fuels.

Sugar producers will soon find themselves obliged to improve the productivity and energy efficiency of their processes in order to satisfy rising demand and survive in a more competitive market.

Power transmission is destined to play a key role in the renewal of production processes.

Bonfiglioli offers customers a vast amount of experience acquired from sugar cane processing plants around the world. This makes us the perfect partner for investments aimed at boosting production capacity and optimising energy efficiency, whether through modernisation projects or new installations.

Our extensive catalogue of mechanical gearboxes is complemented by a complete range of inverters for optimised power transmission and control. Our specific solutions for sugar cane processing include high power, compact gearmotors, planetary and combined gearboxes, and multi-drive solutions complete with inverters for speed control and synchronisation.

Over 60 years of experience in managing and serving key accounts and global partners in a wide range of heavy duty sectors represent a real guarantee of competence, reliability and service.

Our team of application engineers is at your service to examine the requirements of your own plant and propose modern and innovative solutions for improving the productivity, reliability and energy efficiency of your production processes.
Solutions for Sugar Cane Mill Plants
Bonfiglioli Heavy Duty Solutions

300M series
Planetary gearmotors

<table>
<thead>
<tr>
<th>Size</th>
<th>Nominal torque [Nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>316M</td>
<td>134 390</td>
</tr>
<tr>
<td>317M</td>
<td>207 490</td>
</tr>
<tr>
<td>318M</td>
<td>297 550</td>
</tr>
<tr>
<td>319</td>
<td>471 190</td>
</tr>
<tr>
<td>321</td>
<td>655 740</td>
</tr>
<tr>
<td>323</td>
<td>890 310</td>
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<tr>
<td>325</td>
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<tr>
<td>327</td>
<td>1 800 000</td>
</tr>
<tr>
<td>329</td>
<td>2 500 000</td>
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</table>

3/H combined series
Planetary / Bevel gearboxes

<table>
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<th>Nominal torque [Nm]</th>
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</thead>
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<td>471 190</td>
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<td>3/HDO21</td>
<td>655 740</td>
</tr>
<tr>
<td>3/HDO23</td>
<td>890 310</td>
</tr>
<tr>
<td>3/HDO25</td>
<td>1 286 000</td>
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<tr>
<td>3/HDO27</td>
<td>1 800 000</td>
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<tr>
<td>3/HDO29</td>
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</tbody>
</table>

Accessories

OUTPUT SQUARED SHAFT
FLANGE COUPLING
MOUNTING FEET
**HD series**  
Parallel & Bevel gearboxes

<table>
<thead>
<tr>
<th>Size</th>
<th>Nominal torque [Nm]</th>
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</thead>
<tbody>
<tr>
<td>100</td>
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<td>125</td>
<td>49 240</td>
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<td>130</td>
<td>69 570</td>
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<td>140</td>
<td>87 060</td>
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<td>150</td>
<td>117 200</td>
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<td>160</td>
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<td>170</td>
<td>190 190</td>
</tr>
<tr>
<td>180</td>
<td>209 900</td>
</tr>
</tbody>
</table>

**Active Cube series**  
Our solution for Sugar Cane application speed control

**Additional benefits:**
- Energy saving functions embedded into control algorithm
- Highest power density in the market

<table>
<thead>
<tr>
<th>Size</th>
<th>Power kW (Rated voltage 400V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACU401-51</td>
<td>160</td>
</tr>
<tr>
<td>ACU401-53</td>
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<tr>
<td>3xACU401-61</td>
<td>1 200</td>
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</tbody>
</table>

**SPECIAL COOLING UNIT ON BOARD**

Bonfiglioli inverters are produced at the Bonfiglioli Vectron centre of excellence, located in Krefeld, Germany.
Rolling Mills Current Operating Solution

- A big single parallel shaft gearbox
- Wide footprint
- Significant maintenance activities required

Our Solutions

Solution A: Single drive system with planetary gearbox and inverter speed control

Advantages over conventional solutions:
- Reduced footprint
- Reduced maintenance
- Low installation costs
- From 12% to 15% greater efficiency
- Reduced plant downtimes
- Variable speed control by inverters up to 1200 kW (parallel inverter connections)

Solution B: Multi-drive system with planetary or combined planetary/bevel gearboxes and inverter speed and synchronisation control

Advantages over conventional solutions:
- Zero footprint
- Reduced maintenance
- Dramatically low installation costs
- Not more external transmission through open gears for rollers connection
- From 20% to 22% greater efficiency
- Modular design based on standard components that guarantee:
  - Dramatically reduced plant downtimes
  - Reduced spare parts stock
  - Greater autonomy in replacement of the transmission components
- Variable speed control by inverters up to 400 kW (single inverter)
- Individual roller mills speed control and synchronisation with other rollers for an improved milling action.
Rolling Mills Average Operating Efficiency

<table>
<thead>
<tr>
<th>Gear boxes average efficiency comparison of the three operating systems</th>
<th>Conventional Solution</th>
<th>Our Solution (A)</th>
<th>Our Solution (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-phase motor</td>
<td>98%</td>
<td>98%</td>
<td>98%</td>
</tr>
<tr>
<td>Gearbox</td>
<td>85%</td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td>Coupling</td>
<td>Rope type 95%</td>
<td>Squared type 98%</td>
<td>Direct 0%</td>
</tr>
<tr>
<td>Coupling</td>
<td>Squared type 98%</td>
<td>Squared type 98%</td>
<td>Direct 0%</td>
</tr>
<tr>
<td>Crown pinion</td>
<td>90%</td>
<td>90%</td>
<td>0</td>
</tr>
<tr>
<td>Total efficiency with rope coupling</td>
<td>71%</td>
<td>78%</td>
<td>88%</td>
</tr>
<tr>
<td>Total efficiency with squared coupling</td>
<td>73%</td>
<td>78%</td>
<td>88%</td>
</tr>
</tbody>
</table>

Comparison based on installed power of 1000 kW.
- **Conventional Solution**: power actually available to the plant: **710 - 730 kW**
- **Solution A**: power actually available to the plant: **780 kW**
- **Solution B**: power actually available to the plant: **880 kW**

Diffuser Plant

**Solution**: Double motorised drive shaft with electronic control of torque distribution.

- Greater efficiency than in conventional systems with single, parallel shaft gearbox.
- Significantly smaller footprint and installation costs.
- Shorter repair times in the event of failure.
- Possibility of continuous cycle operation at reduced load using only one gearbox.
- Variable speed control by inverters up to 1200 kW (parallel inverter connections).

**300M series**

Planetary gearmotors

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<td>2x323</td>
<td>1 780 620</td>
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<tr>
<td>2x325</td>
<td>2 572 000</td>
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<td>3 600 000</td>
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<tr>
<td>2x329</td>
<td>5 000 000</td>
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</tbody>
</table>
Sugar Cane Applications
## Bonfiglioli worldwide locations

### Australia

www.bonfiglioli.com.au  
2, Cox Place Glendenning NSW 2761  
Locked Bag 1000 Plumpton NSW 2761  
Tel. + 61 2 8811 8000

### Brazil

www.bonfiglioliodobrasil.com.br  
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Bloco 3 - CEP 09861-730 - Bairro Assunção  
São Bernardo do Campo - São Paulo  
Tel. +55 11 4344 2322

### China

www.bonfiglioli.cn  
Bonfiglioli Drives (Shanghai) Co., Ltd.  
#68, Hui-Lian Road, QingPu District,  
201707 Shanghai  
Tel. +86 21 6700 2000

### France

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Zone Industrielle de Moimont II - 95670 Marly la Ville  
Tel. +33 1 34474510

### Germany

www.bonfiglioli.de  
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Tel. +49 0 2131 2988 0

### Industrial

Europark Fichtenhain B6 - 47807 Krefeld  
Tel. +49 0 2151 8396 0  
O&K Antriebstechnik  
Ruhrallee 8-12 - 45525 Hattingen  
Tel. +49 0 2324 2050 1

### India

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Tel. +91 44 2478 1035

### Industrial

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Mannur Village, Sriperambudur Taluk - 602 105 Chennai  
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### Mobile, Wind

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### Industrial

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Tel. +39 059 786511  
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Tel. +39 02 985081

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### Spain

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08040 Barcelona  
Tel. +34 93 447 84 00

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Tel. +1 859 334 3333

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Locked Bag 1000 Plumpton NSW 2761  
Tel. + 61 2 8811 8000
We have a relentless commitment to excellence, innovation and sustainability. Our team creates, distributes and services world-class power transmission and drive solutions to keep the world in motion.