Precision rail weighbridge
The new coupled-in-motion scale

METTLER TOLEDO recently completed the installation and commissioning of a new automatic rail weighbridge for AusBulk – one of Australia’s premier grain industry companies. It is the first of its type in Australia and more accurate than existing dynamic scales.

This new coupled-in-motion rail weighbridge is located at Grantham siding, south of Port Lincoln on Eyre Peninsula. Grantham is a rail ballast storage and loading area used by the Australian Railroad Group. The location is suitable for accurate dynamic weighing because of the level terrain and straight track.

Three months execution time
The project began in mid-September with the removal of about 55m of main line, excavation and earthworks for the weighbridge and the 2x20m concrete approaches. Construction was completed mid-November. Commissioning and verification for trade use was carried out during a five-day period in mid-December, only three months after the project commenced.

The National Standards Commission required a train of thirty railcars for the verification. This train traversed the scale ninety-nine times to ensure consistent results were attained.

Major cost savings
This scale enables AusBulk to weigh the trains while they are traveling. On a typical scale they would have to stop and weigh each car individually – wasting hours of precious time. Now the trains are quickly weighed and then move to their next destination allowing AusBulk to process more shipments in a given time. The bridge consists of 4m and 8m long sections (separated by a 3m spacing).
and is supported on ten 45-tonne POWERCELL® MTX load cells. Wheel sensors on the short bridge detect the speed of the train. Signal lights show the train driver the correct speed range to maintain for highest accuracy: between 0.5 and 9km/h.

**Comprehensive railcar weighing system**
The high-performance load cells measure each railcar on the weighbridges and send information to the METTLER TOLEDO 9411E in-motion-controller over a high-speed digital interface, where the weight of each railcar is recorded. An RFI tag recognition system collects the railcar identification from each railcar as it passes over the weighbridge. This data is collected and downloaded from the 9411E to AusBulk’s Port Lincoln Grain Terminal via RailLink® a METTLER TOLEDO data management system. AusBulk uses the data in its commodity storage database within its Operational Management System.

Both loaded trains (gross mass) inbound Port Lincoln and the empty outbound trains (tare mass) heading up-country are weighed to tolerances of 0.21% for each of the railcars and 0.1% for the entire train. When the fully loaded trains return, the initial tare weight is subtracted from the full weight to determine the weight of the goods coming into port.

A normal grain train weighs about 2400 tonnes fully loaded. A typical train consists of three locomotives and forty-four railcars, each carrying approximately 40 tonnes of grain, so the average train is hauling 1600 tonnes of grain. The weight of the three engines is automatically subtracted to give true net weight.

The new dynamic weighing system takes all guesswork out of transferring grain from receiving sites to the shipping terminal. It also provides highly accurate records for the rail movement of grain throughout the Eyre Peninsula.

**Key benefits 9411E coupled-in-motion (CIM) controller:**

**Unattended operation**
Allows automatic weighing and data capture – no operator required.

**Attended mode**
Allows the operator to weigh trains, enter car information for cars not identified with the RFI tag, and print train reports.

**Rollback detection and recovery**
Allows accurate and complete train weighing even if the train reverses direction, such as in load-out operations.

**Expanded diagnostics**
When used with METTLER TOLEDO POWERCELL® MTX load cells, the 9411E identifies potential problems, even down to the individual load cell, allowing corrective action to be taken before a problem occurs.

**Continued accuracy**
The 9411E and dynamic scale comply with local regulations and are constructed so that frequent recalibration is not necessary.
Full control of inbound and outbound goods
by extremely reliable vehicle weighing

METTLER TOLEDO manufactures a wide range of vehicle and rail scales designed to meet your specific requirements. Our OverDrive™ vehicle management software creates a comprehensive and simple-to-use material monitoring package, providing full transparency into inbound and outbound material flow. Treating yourself and your customers fairly is dependent on 100% accurate weighing. A damaged sensor could cause your scale to register incorrect weight. The METTLER TOLEDO POWERCELL® MTX load cell tells your operator in seconds that you are at risk to lose money or valuable customer relationships. In addition, the POWERCELL® MTX is resistant to lightning, can be submerged, and now is one of the first digital vehicle scale load cell rated both IP68 and IP69k. A routine maintenance plan keeps your METTLER TOLEDO scale operating at top performance, reducing the total cost of ownership.

Key customer benefits
• Optimized plant efficiency with transparent inbound and outbound material control
• Extremely low failure rate through a rugged and reliable solution
• Fast and precise shipment completion

Fast facts POWERCELL® MTX
• 25t, 45t and 90t load cell, >1000t scale capacity
• 3000e-6000e OIML, 5000e-10 000e NTEP worldwide approval
• Tested and proven for prolonged submersion and high pressured hosing (IP68/IP69k)
• Integral lightning protection
• More than 500 000 in worldwide use
• Instant failure notification
• Digital close loop correction of:
  – Temperature influence
  – Zero change
  – Hysteresis/linearity
  – Weighbridge creep
  – Vibration
• TraxEMT™ (Asset Management Monitors):
  – Individual cell overload
  – Scale overload-shock
  – Number of cycles
  – Symmetry and drift

Fast facts OverDrive™
• Complete vehicle scale management system
• Transaction screen
• Database tables for account, carrier, company, container, contract, driver, permit, product, surcharge, tax, trailer, vehicle and twenty-five additional tables
• Two generic text-entry fields, two numeric-entry fields
• Data grouping function “presets” and transaction “learning” capability
• Password protected user log-on
• Transaction maintenance, standard or custom reports and tickets
• Weights and measures “alibi” log
• Runs on Sybase, MS-SQL, or Oracle database
• Networkable for multi-user applications
• Optional 24/7 unattended operation

The OverDrive™ transaction screen makes it easy for your operators to process transactions. It enables you to compile information from dozens of database tables in seconds. Configure the screen to show exactly the information that your operation requires.
Dedicated to the food segment, Molinos Río de la Plata offers a wide product range including dry pasta, frozen food, home bake products, frankfurters, vinegars. However, their main products are soybeans, sunflower seed oil and animal feed pellets.

High throughput
Molinos Río de la Plata owns twelve factories in Argentina, three of them dedicated to grains and oil. Two of these factories are located in the Rosario city area: the San Lorenzo plant is an edible oil production and port facility and Santa Clara a refining and bottling facility. The San Lorenzo plant processes 18,000 tons of soybeans per day and the Santa Clara facility around 4,500 tonnes. To support these operations, around 1,200 trucks must be weighed daily. The Santa Clara plant is certified after ISO 9001:2000, GMP13 (animal feed) and CTP (security, hygiene and environment). Both plants are coordinating their manufacturing process as shown in the graph below.

Receiving
Incoming trucks are weighed on truck scales, then several samples from truck and trailer are immediately checked for water content and impurities. After the content is discharged, the truck is weighed again to determine its net weight. Few minutes later, the driver receives a document with gross weight and quality parameters, and the final value of his delivery.

METTLER TOLEDO equipment:
- Eight truck scales: 80 tonnes capacity, 21 and 25m length with JagXtreme® terminals
- Two rail scales: 100 tonnes capacity, 15m length with JagXtreme® terminals
- Proximity cardreaders for truck identification
- Integrated Ethernet communication to the plant’s ERP system

Key benefits
- High throughput, heavy duty scales up to 300 trucks per day each
- No production disruption, fast and reliable weighing
- Immediate, error-free processing of data about incoming goods
- POWERCELL® technology provides high accuracy and reliability

Founded in 1902, Molinos Río de la Plata, one of the leading companies in the food industry in South America, now operates one of the most important edible oil production centers of Argentina. The company is present in more than fifty countries around the world. With METTLER TOLEDO weighing solutions in receiving, production and shipping, the processes are controlled twenty-four hours seven days.
Production process control

Bulk weighers are continuously weighing soybeans and sunflower seed, to control factory throughput and yield (24 hours 7 days).

**METTLER TOLEDO equipment:**
- Three bulk weighers each handling 350 tonnes per hour (4 tonnes capacity, 80-90 batches/hour)
- JagXtreme® terminals with custom program for bulk weighing process control including
  - I/O to control gates, level sensors
  - Proximity detectors I/O
  - Hazardous area – safety barriers
  - Tension weigh modules

Shipping control

Unloading or loading of a ship takes several days; therefore high throughput batch weighers exactly determine weight and value of the load.

**METTLER TOLEDO equipment:**
- Bulk weighers each handling 800 tonnes per hour (10 tonnes capacity, 80 batches/hour)
- JagXtreme® terminals with custom program similar to production process scales

---

Mr. N. Braten, Plant Manager at Santa Clara, concludes: “As Molino’s production processes run 24 hours a day and almost 365 days a year, we need highest accuracy and reliability. This is what METTLER TOLEDO solutions provide.”
Fulfill average weight legislation and reduce costs

Accurate monitoring of portions and final product weight is essential for controlling material use and fulfilling net content legislation.

METTLER TOLEDO solutions for Statistical Quality Control (SQC) combine ease of operation, quality data management and analysis functionality. Sampling of fill quantities, for liquid, powder or solid products, immediately following filling allows precise adjustment through operator prompting or closed loop control to the filler from a dynamic checkweigher. Unnecessary material losses are avoided and legal fill quantities and average weight regulations are met. Production processes surveyed by a METTLER TOLEDO SQC system conform with internal and external standards such as ISO and GMP. Our standalone compact solutions (SQC14, SQC16) or networked systems (FreeWeigh.Net®) provide statistical data, to understand, document and control quality and profitability.

Key customer benefits
- Save money by reducing overfilling
- Avoid legal complaints
- Simple and informative online status of filling process, allowing quick reaction
- Streamline internal QA procedures

Solutions that pay back!

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw material costs</td>
<td>1.–</td>
<td>EUR/kg</td>
</tr>
<tr>
<td>Packages produced</td>
<td>100 000</td>
<td>Units per day</td>
</tr>
<tr>
<td>Nominal fill quantity</td>
<td>100</td>
<td>g</td>
</tr>
<tr>
<td>Production days</td>
<td>250</td>
<td>Days per year</td>
</tr>
<tr>
<td>Production mean value</td>
<td>101</td>
<td>g</td>
</tr>
<tr>
<td>Overtill per package</td>
<td>1</td>
<td>g</td>
</tr>
<tr>
<td>Overtill per day</td>
<td>100</td>
<td>g</td>
</tr>
<tr>
<td>Overtill per year</td>
<td>25 000</td>
<td>kg</td>
</tr>
<tr>
<td>Overtill losses</td>
<td>25 000.–</td>
<td>EUR/year</td>
</tr>
</tbody>
</table>
Swissmill in Zurich is Switzerland’s biggest flour and semolina producer. Several mills operate in Zurich: two mills for grinding soft wheat; one each for durum wheat, corn, and oats; and a specialty mill. Swissmill is IFS and BRC certified and serves a wide range of customers, from small village bakeries, bread factories and retailers to food processing operations.

The total annual output of soft wheat, durum wheat, corn, and oats is 200,000 tons. On high-speed packaging lines – for packages up to 5kg – around 15 million items are bagged and controlled yearly. During packaging, Swissmill must verify net content as well as rule out metal contamination to comply with average weight legislation and to ensure consumers safety.

Product Inspection
With METTLER TOLEDO product inspection systems, both net content and metal contamination are controlled and faulty packages are rejected. Swissmill has integrated four Garvens checkweighers and Safeline® metal detectors in its packaging lines. The detectors can weigh up to 800 items per minute and are designed to meet HACCP guidelines. With a stainless steel construction and easy-to-clean design, hygienic compliance is made easy. The combined metal detector and checkweigher unites the advantages of both in-line weight monitoring and metal detection in a compact system.

Net content control
To comply with average weight legislation, Swissmill has successfully implemented SQC14 – a compact Statistical Quality Control system from METTLER TOLEDO. Net content is statistically reported and the results are graphically represented on printouts. Trend analysis software triggers alarms to alert the operators when filling machines are tending to under- or overfill. Unnecessary overfilling can be avoided and net content control is simplified.

Laboratory
Consistently high quality is crucial for Swissmill. In the laboratory, raw materials, semi-finished and finished products are regularly quality tested. METTLER TOLEDO analytical instruments such as the SevenEasy™ pH-meter or the DL50 titrator, as well as halogen moisture analyzers such as HB45 or XP precision balances ensure that quality parameters are systematically checked and optimized.

Mr. Eigenmann, Production Manager, concludes: “Swissmill is continuously updating production processes and systems, ensuring the market will be supplied with innovative, competitive, high-quality products also in the future. With the support, great performance and wide range of products, METTLER TOLEDO is helping us to be successful in our business.”
A wide range of solutions to improve processes

1. SevenGo™ portable pH-meter
2. In-line pH and turbidity sensors
3. DL22 Food and beverage analyzer
4. Halogen moisture analyzers

Share our knowledge

Learn from our specialists – our knowledge and experience are at your disposal in print or online.

Learn more about all of our solutions for the bulk food industry at our website. You can find information on a wide range of topics to improve your processes, including case studies, application stories, return-on investment calculators, plus all the product information you need to make an informed decision.

1. Straight talk about your next truck scale
2. How to build a tank scale
3. Statistical Quality Control/Statistical Process Control
4. Process weighing

Your METTLER TOLEDO contact:

www.mt.com/ind-bulk-foods