Reliable calculation of sugar content
The link between farmer and factory

Iscal Sugar Fontenoy is part of the Iscal Sugar S.A. group, the second largest sugar manufacturer in Belgium, representing one third of the national sugar production. The Fontenoy site decided to invest in a new process control system to accurately determine sugar content and therefore the grower’s payment.

Each load of sugar beets entering the factory is weighed and sampled. A random sample of 100kg is checked for:

• soil tare – the amount of non beet delivered
• crown tare – the part of the beet containing little sugar
• sugar content – amount of sucrose in the crop

From these parameters the actual sugar content of the load is calculated and the grower’s payment determined.

Basis for implementing a new system
Mr. Bruno Wyckhuys, Head of Automation Systems, explains his motives for implementing a new system. “With the old system we were faced with two problems. Firstly, we weren’t getting the support we needed for the installed system and secondly, there were hardware problems. Sugar content determination is an important process for us as it is the basis for the farmer’s payment. Under no circumstance could we have an unsynchronized process or even worse sample mix-ups. It is of the utmost importance that the farmer gets the correct value of his sample. With the old system the samples were not always at the right place at the right time. This was detected very easily but it took me up to 3 hours to resynchronize. Most times I succeeded but sometimes I didn’t. In that case we had to remove all the samples which were being processed and start from scratch. On top of that we needed more...
capacity since the flow of trucks was increasing due to factory consolidations. A highly performing and technically perfect sampling process was needed.”

Reasons for choosing METTLER TOLEDO as a partner
Iscal Sugar had already installed a vehicle scale equipped with a JagXtreme® process terminal. The installation went perfectly and was done within the agreed timeframe. The Moerbeke mill – a sister site – is also equipped with METTLER TOLEDO weighing instruments for sugar content determination and a vehicle scale.

Mr. Wyckhuys states, “Our goal was to make the equipment uniform throughout the group that we only need one spare part. We had received very positive feedback regarding the performance of METTLER TOLEDO’s support services from the Moerbeke site and from other companies. We knew that we could count on their system specialists, service and support capabilities. Peace of mind and the knowledge that you can rely on someone in case of problems are very important considerations, so service was a decisive argument.”

How the sampling process works
The farmer arrives at the weighbridge with an ID-card
- A barcode reader reads the data from the card
- The system verifies the data
- If the data is correct, a random sample of around 100kg is taken
- The driver discharges the trailer
- The sample reaches the conveyor belt entering the sampling process

1. Initialization
The PLC tells the first JagXtreme® (Master) a new sample has arrived. The JagXtreme® allocates a number to the arriving sample and forwards it to the other Gross 1, Net 1, Gross 2, Net 2 JagXtreme’s.

2. Soil tare determination
- Hopper Gross 1 is tared and weighed
- The sample is rinsed to remove stones, dirt,… and moved to hopper Net 1
- Hopper Net 1 is weighed to determine the soil tare

3. Crown tare determination
- A sub sample of about 25kg is taken
- Hopper Gross 2 is tared and the sub sample is weighed
- The crowns (containing a lot of impurities and little sugar) are cut away
- The sub sample is moved to hopper Net 2
- Hopper Net 2 is weighed to determine the crown tare

4. Sugar content determination
The remaining sugar beets pass through a grating machine. From this substance, another sample of 25g is taken to determine the quality of the sugar content via a chemical reaction and a saccharometer.

5. Invoicing
The sugar content value, Gross 1, Net 1, Gross 2 and Net 2 weighing records are forwarded to the invoicing system.

Iscal Sugar’s key benefits
“With the JagXtreme® process terminals we opted for a simple solution to control a complicated process” says Mr. Wyckhuys. “I could keep my PLC to manage the sampling process. The big difference is that the JagXtreme® does not only weigh but also remembers the values. It makes a record in connection with software developed by METTLER TOLEDO which is in turn communicating with the PLC.”

Mr. Wyckhuys no longer has to deal with the weighing part. He only has to survey the automation system.

The fact that weighing and automation have separate networks is an additional advantage. The JagXtreme’s network uses Ethernet for weight data transmission and the PLC has its own separate network via Profibus®. Mr. Wyckhuys continues: “All these positive elements were put into place due to a very smooth relationship with the METTLER TOLEDO engineering department, that was on site to carry out tests and to understand and “feel” our needs.”
What if a breakdown should occur?
Another big advantage is the continuity of the system, states Mr. Wyckhuys. “In the past a break-down meant the whole sampling process came to a stop. The JagXtreme® terminals on the other hand are able to save the data for an entire production day. When the system is down, the sampling activities can simply continue independently. All the records are saved and with a simple manipulation on the PC the non-transmitted data can be retrieved.”

Every JagXtreme® has its own printer. If one of them is not working, this is no problem as the data is saved in the system and can be transmitted later on. Tickets are stocked at the end of the day, just in case a complaint is received. A representative of the farmers is also present all day. He has its own printer to verify that the system is running correctly.

“To sum it all up”, states Mr. Wyckhuys, “it’s a system that works very well. We have not had any unsynchronized processes since the start-up. We succeeded in a simple installation even though the process is complex. Our setup only needs a few PC’s but we could also work without them. The sampling process is operated with rugged industrial equipment which hardly ever breaks down.”
Fast, reproducible and reliable batching and filling are key success factors for your production process. Various factors can affect precision: foam can compromise optical/radar sensors, and solids do not distribute evenly in a tank or silo. Our weighing technology is not affected by these conditions and provides direct, accurate and repeatable measurement of mass without media contact. In addition our range of terminals and transmitters/sensors enable easy connectivity to your control systems.

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- Faster batching process through supreme TraxDSP™ noise and vibration filtering
- Minimal maintenance cost

**Process terminal PTPN**
- Local display for weight indication and calibration checks
- Panel-mount or stainless steel desk enclosure

**IND130 smart weight transmitter**
- Direct connectivity where no local display is required
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**Fast facts terminals/transmitters: PTPN and IND130**
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**TraxDSP™** ensures accurate results even in difficult environments with vibration
Rugged bulk weighing applications at Lanshan harbor in China

High-performance bulk weighers and bagging scales from METTLER TOLEDO make sure that China’s most sophisticated grain store is running efficiently.

Rizhao port group’s Lanshan harbor limited company is located in Rizhao—a new growing port city on the coast of the Yellow Sea. Lanshan harbor is an important grain distributing center with an annual throughput of over ten million tonnes. The corporation has obtained ISO9001 quality system certification.

China’s most advanced grain store

The main operations at Lanshan harbor are receiving and unloading, storage and transit of soybeans, corn, and grain. The discharging capacity of this system accounts for 1200t/h, total storage capacity is 100 000t and the filling capacity is 10 000t/day.

All weighing equipment—including two sets of bulk weighers (600t/h per scale) and twenty-four sets of bagging scales—were purchased from METTLER TOLEDO. Since the scales were put into operation, about one million bags of soybeans have been filled.

Today, many customers have very strict measurement requirements, since they need to trade and make payment for individual bags. After using the new system for two years, Mr. Jin Liping, vice Manager at Lanshan harbor, states: “Compared to other weighing equipment, products of METTLER TOLEDO feature high stability for both static and dynamic scales, accurate measurement, and remote maintenance. In addition, METTLER TOLEDO provides fast and careful services.”

Excellent service

Remote maintenance guarantees that the port’s operation is running smoothly. Mr. Jin Liping states: “When we were unloading a cargo with 60 000 tonnes of soybeans, a problem occurred at 8 pm. Our technician called METTLER TOLEDO, and an hour later the problem was solved through the remote maintenance system.”

Mr. Jin concludes: “We are fully convinced that our port trade will improve through long-term cooperation with METTLER TOLEDO. We are very happy with the performance of the products and the high quality service.”
A wide range of solutions to improve processes

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