CASE STUDY

State of the art equipment will improve our operational efficiency

Pioneer Foods' new mill installation is completed by Alapala

Pioneer Foods was established in 1997 and today the group is one of the largest South African producers and distributors of a broad range of branded food and beverage products. As a leading FMCG group, Pioneer holds well-loved and trusted brands like Weet-Bix, Liqui-Fruit, Ceres, Sasko, Safari, Spekko and White Star within Africa.

The group operates mainly across South Africa providing wholesale, retail and informal trade customers with products of a consistently high standard. The group also exports to more than 80 countries.

The Essential Foods division within the group consists of Grains and Bakeries operations. The Grains business consists of five wheat and three maize mills, as well as two rice and dried vegetable packing facilities and a pasta plant. Alapala was contracted for the supply and installation of selected milling equipment required for the expansion of wheat milling capacity in Durban.

Project installation stage

Manufacturing Executive, Jabus Wessels, said that partnering with Alapala was an exciting first for Pioneer Foods. Our installation teams collaborated with Alapala's technical teams and the equipment was seamlessly integrated into our mill automation and control systems.

We are confident that the new state of the art equipment will improve our operational efficiency and boost the quality of flour supply to our customers. With direct access to Alapala's technical and milling expertise in Çorum, Turkey we look forward to future collaboration and projects.

Project details

Pioneer Foods' wheat milling capacity in Durban was more than doubled through the installation of a second milling line to produce high-quality baking flour for its two KZN bakeries and to serve the regional market more effectively.

The new mill has been designed to produce a wide variety of low ash pastry and cake flour, multi-purpose flour and bakery flour for bread. Both local and imported wheat is used as raw material

depending on seasonal availability, cost, and quality.

The plant design conforms to sanitation standards and food safety regulations, with food-grade materials that have been carefully selected for each position in the building.

Mill management is carried out with an advanced automation system, combined with Scada software that allows centralised monitoring of the entire milling process and generating detailed reports on production data. Overall, the system provides excellent process control and traceability. Automation software is also combined with a yield control module, which collects and analyses weighing information by DURA Extraction Rate Scales from eight different places in the process.

Flour quality is controlled through Near Infrared Technology (NIR) instant analysis, to track and diagnose any deviation in quality parameters (ash, moisture, etc) ensuring products of the highest quality are consistently produced.

Cleaning unit

After intake, the wheat is taken into daily bins and goes through the grain separator, dry stoner, scourer cleaning machines, as well as magnetic separators. Here we also see that Pioneer Foods has recognised the benefit of optical sorting technology, and a color sorter is used for the fine removal of foreign seeds, damaged kernels, etc to ensure the highest level of food safety is achieved.

A start-up silo is used at the start of production, or during the shifting of production between different flour types. The purpose of this silo is to collect the residual material from the previous shift/ production run, to ensure the highest level of hygiene and product standardisation.

Air Plus Jet Filter (KFSA) is used for cleaning of the ambient air in the mill. These filters have also been equipped with explosion relief for operational safety.

Milling unit

Pioneer Foods selected new generation Alapala milling machines,

combining design and engineering experience with the latest technology.

Similago II Roller Mill

As we stopped on the roller floor, we came across one of Alapala's innovative solutions - the Similago II Roller Mill. This is a premium roller mill that won Milling & Grain's GRAPAS Innovations Awards in 2015 for its design and innovative technological revolution.

The roller mill has PLC controlled product feeding and grinding control systems to ensure continuous and consistent grinding performance with high operational safety.

The roller mill has an internally aspirated inlet bunker with polycarbonate inspection glass against condensation. The feed rate is automatically controlled by using a capacitance sensor at the inlet bunker, which sends a signal via PLC to regulate the speed of feed rolls.

Grinding rolls also have a sensitive grinding gap adjustment and are protected with a special mechanism that gives flexibility to the grinding rolls against oversized objects. The grinding group is also equipped with sensors for monitoring the positioning of rolls, rear roller speed, etc. for operational safety.

Roll changes can be carried out within 20 minutes and no special tools and lifting devices are required for the dismantling of roll sets. This reduces downtime to the minimum.

The graphical touchscreen of the roller mills also drew our attention. This allows the setting of operational parameters, as well as monitoring feed roll speed, motor load, and power consumption.

The central lubrication system is also one of the important features and is optionally fitted in each roller mill for easy maintenance.

AURORA Quadro Plansifter

Moving through the plant, another one of Alapala's latest solutions present in the Pioneer mill was the Aurora Quadro Plansifter (GPAK). The oscillating drive system of the plansifter is quite strong for heavy-duty working conditions.

Inside the plansifter, 30 sieve boxes can be fitted into each sifting compartment, and 'G'-type large wooden laminated sieve boxes are used. These have 22 percent extra sifting capacity than the standard sieves.

This is also a very hygienic sifter with an excellent impermeability, smoothened interior surfaces, and condensation-free insulated panels. There is no risk for the growth of micro-organisms and insects cannot enter the machinery and take shelter.

ARION Purifier

Alapala's Arion Purifier (AISA) is an innovative and highly efficient unit for purification and classification processes.

The purifier has two aerodynamic air channels with independent regulating valves, which creates optimal airflow and ensures peak performance for the separation of bran and other light materials.

The Arion also has silent, energy-efficient and maintenance-free vibromotors, ensuring that the Arion Purifier is particularly efficient.

Product handling

The installation of pneumatic and mechanic transport equipment fully conforms with EU standards, and precautions were taken at each place to ensure safe and hygienic product transfers in the mill.

All spouting used for pneumatic product transfer is made of stainless steel. The hygienic design of the tubular screw conveyors, chain conveyors and elevators prevents product adhesion and accumulation.

The pneumatic aspiration line is controlled by pressure difference sensors, which are used at various places to limit any clogging, accumulation or leakage.

All interior silos are equipped with pressure control equipment against the risk of static electricity or dust explosion.

A separate room is reserved for high-pressure equipment such as blowers, air supply, compressors, etc. Also, air suction is used in all machines to prevent dusting and to stabilize working pressure.

Packaging

We were very impressed to see a fully automated packaging and palletising system in the packaging units. This equipment reduces the required manpower in the packaging line significantly.

Here the blending operation is carried out for the mixing of different flour streams to match the specifications of each customer requirement.

Control Mono Sifters (RKES) are also used for final control and safety of the flour before packaging and delivery. As a final step, the flour is either packed in 10kg, 12.5kg, 25kg or 50kg paper bags, or distributed in bulk tanker loads.

Alapala

Founded in 1954, Alapala Machine is one of the global leaders in milling machinery and technologies. The company was established with the vision of leading the milling industry.

Alapala is among the top two companies in the world within this field and taking big strides to fulfill its vision. Alapala builds and services turn-key plants of any desired capacity and is one of the Top-1000 exporters in Turkey. Exporting 95 percent of its production, it has a considerable number of turn-key references in over 100 countries and on four continents across the globe.

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