Oriental noodles or pasta - efficiently produced and packaged

Pavan implements innovative production solutions based on drive and automation technology from Siemens

Although the words pasta and noodles are sometimes used synonymously, the two products not only differ – regarding the ingredients used the durum wheat for pasta and soft wheat flour for noodles – but also when it comes to the manufacturing process itself.

The innovative automation solutions created by the Pavan Group with its complete production processes from production through to packaging guarantee the same taste experience as a hand-crafted product.

The Pavan Group

The Pavan group is an industrial company that is active in the food sector. It develops systems and machines for companies that are looking for innovative and competitive solutions. The company enjoys international acclaim as a result of its unique and flexible solutions. Founded in 1946, Pavan has developed technologies and gained experience that gives pasta producers specific competitive advantages to address new production demands.

Research and Development

Pavan’s research and development department is the showcase of the company. This is a highly specialized team, who together with technical colleges and other companies, work on developing products and processes. This team is made up of 30 persons including process engineers, analysts and mechanical engineers. They have 3 systems and 4 production lines at their disposal that they can use to test new products and processes. The laboratory is equipped to perform chemical, physical, rheological, nutritional and taste analyses.

Production line for nest-shaped oriental noodles

The Pavan Group, which has a global leadership position in the development and design of machines and systems for the food industry, recently installed a production line for a well-known multinational company. This line produces 1500 kg of noodles every hour. The product is a pre-cooked dry noodle, which is supplied in “nests” weighing 67.5 g. The production line involves mixing, rolling, cooking and cutting the dough, drying in containers, cooling and packaging the final product. This innovative Pavan solution sets itself apart as the production process-
es that were previously manually performed have all been completely automated, but still keeping the same quality of taste that one knows and expects from traditionally crafted products. The packaging concept implemented by Pavan is also just as innovative: The nests of noodles are stacked and packaged to create compact 400 g packets.

**Drives and automation**

In order to comply with customer requirements, the Siemens motion control system with the SINAMICS S120 drive was selected. The SINAMICS drive has firmly established itself in the market as a result of its versatility, and has already proven itself in a wide range of applications: It can be used as distributed, standalone version (AC/AC) or for single-axis applications. With the booksize version (AC/DC), several motors can be centrally controlled with the possibility of optimally managing the regenerative motor energy.

Pavan was looking for a system with a high degree of integration for the hardware and software components of the automation system. Their objective was to optimize programming and installation times, and also have a single platform for the open-loop control and maintenance. The TIA (Totally Integrated Automation) systems from Siemens allow a single platform to be created for the drives and HMI, which not only secure the integration, but also provide powerful diagnostic functions at all levels: from the PLCs up to the operating state of the communication network and even the diagnostics of individual drives and converters. For a production line with such high capacities, the quantities of ingredients processed and the dimensions of the system itself are considerable, whereby the number and frequency of faults could be reduced to a minimum. The complete system comprises several stations and has an impressive length. Even the main conveyor chain is over 70 m long. The product must be processed in synchronism and with absolute precision in each and every operating step. This is the reason that Pavan selected servomotors (Siemens 1FK7 series) in conjunction with SINAMICS S120 drives with DRIVE-CLiQ. This digital bus allows motor data to be automatically read out. As a consequence, commissioning is speeded up and mistakes when installing or replacing devices are avoided. The model and serial number of motors are automatically identified, therefore preventing an incorrect motor from being inadvertently installed. The dynamic and flexible properties of the new generation of SINAMICS motor modules have permitted several known constraints of the previous technology to be overcome, therefore...
paving the way for new mechanical concepts. In the food sector, this means that higher quantities of product can be processed in any given time period, and multi-format production runs can be optimally controlled. All of this has been made possible as a result of the flexibility of the Siemens control system – starting with the PLC S7 300T up to the monitoring system – along with the mechanical configuration separate from the product, therefore shortening format change times and increasing line productivity. Thanks to the improved production features and the increased motion performance of the mechanical modules, the footprint of the system was able to be reduced and at the same time optimized.

### Highlights

- Motors with a high dynamic performance increase the mechanical performance of the system
- Regenerative drives are used to optimize the energy efficiency
- Products are completely integrated and there is a remote diagnostics option
- The production line was shortened as a result of the increased performance of the mechanical modules
- Flexibility when controlling the format changed
Technology leveraged to support customers

Customer service and technical service are what set a forward-thinking and efficient company apart. The assembly, acceptance and technical service department plays a key role in Pavan.

Service calls are carried out worldwide and quickly, when required, also using teleservice. Remote control and remote diagnostic systems from Siemens are ideally suited for these types of applications. Intervening in or diagnosing individual drives, or the complete production line architecture, monitoring variables and processes, downloading updates or new program components are only a few examples. Pavan offers a real value added to the sector with its solutions, so that systems for foodstuff production are converted from rigid electromechanical assemblies into flexible structures with a high dynamic performance. By selecting Siemens, Pavon has a reliable partner with first-class technical solutions for the automation of production lines and motion control systems.