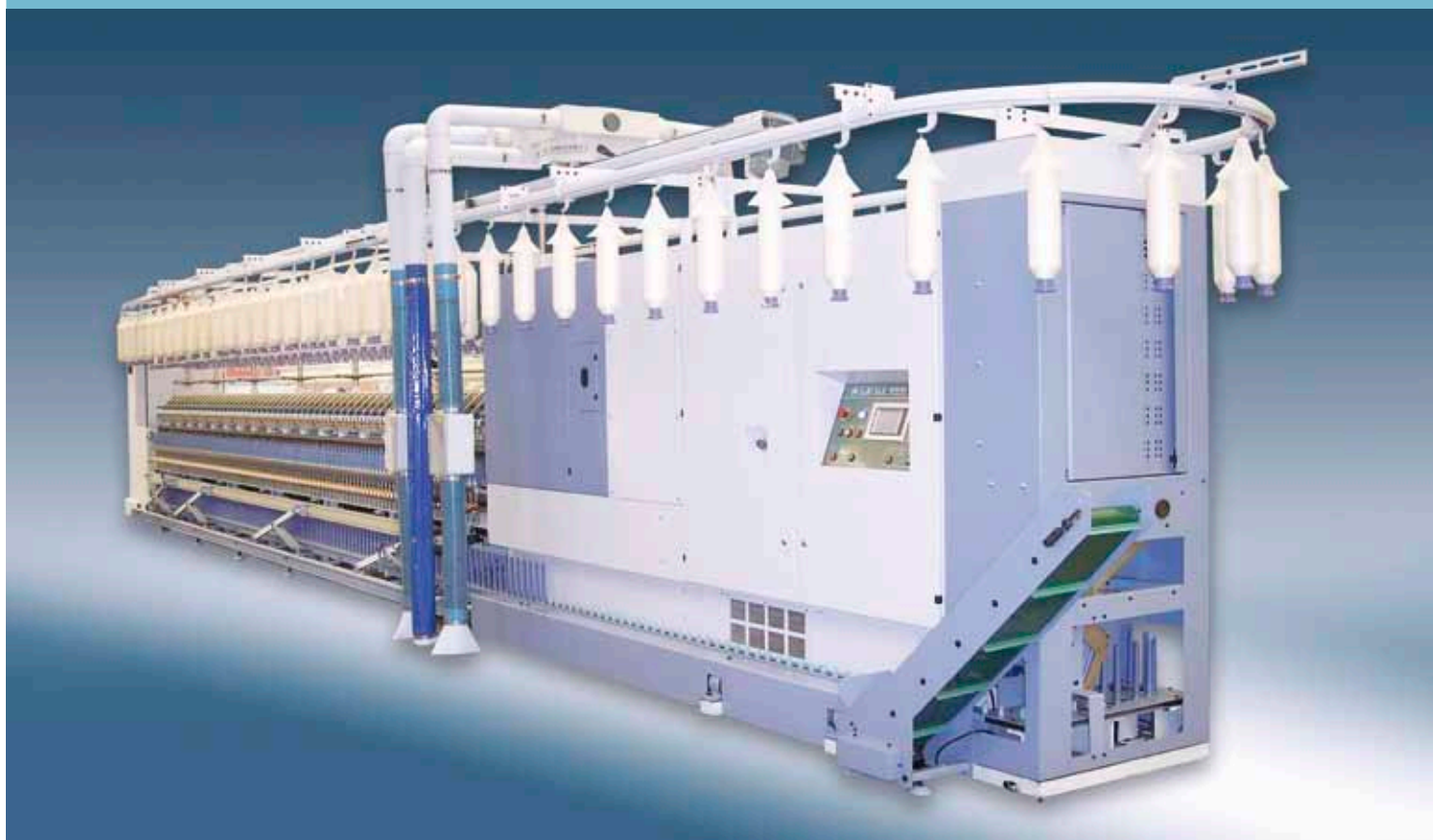


The finest thread

The most important process values in the textile industry are the production of high-quality goods that meet the demands of fashion-conscious customers and a high level of production output. A high material output rate and perfect synchronization of spindle movements for achieving optimum production results requires the use of the latest control technology. Through integration of fundamental process parameters into a mathematical model, the Pacific Mechatronic Group provides a new machine solution that is characterized by a simply structured process sequence.



The Pacific Mechatronic Group is one of China's most important textile machine manufacturers and has specialized over the years in the development of cotton spinning, synthetic fiber, cord, wool, dyeing and dressing machines.

The search for a new machine solution

In 2007, the Chinese company began an ambitious project for constructing a brand new spinning machine. Among the challenges was integrating a total of 1,512 spindles as well as an integrated doffing element (doffing describes the automatic spindle change). Unlike the previous machine solutions, the new construction is characterized by its unique length.

In the course of project implementation, the Pacific Mechatronic Group has placed significant emphasis on applying modern drive technology, which represents a clear trend of deviating from complex mechanical power transmission. This criterion can best be fulfilled with B&R as automation partner. By using a modern servo drive system, the new spinning machine can be flexibly adjusted to today's rapidly changing market demands and customer needs.

In addition to implementing an automatic drive system, several additional points should be noted in the development phase: For example, the engineers placed special emphasis on optimized heat dissipation. Because the switching cabinet must be sealed as tightly as possible in order to prevent fibers >>

from entering, the heat build-up of the electronic drive components is most often the point of failure. This is somewhat alleviated by mounting the heat sink outside the switching cabinet. This can be easily implemented with ACOPOSmulti because this drive system features three different cooling designs. For this type of feed-through mounting, the heat dissipating heat sink is located outside of the switching cabinet and prevents any unnecessary heat dissipation in the switching cabinet. This eliminates the need for extra climate control.

Lower acquisition and operating costs

The ACOPOSmulti can be operated with input voltages of 230 - 480 VAC and is thus designed for several different supply voltages. The supply module provides a constant DC bus voltage even for several different supply voltages, which ensures constant operating conditions. The flexible inverter modules can drive up to two motors, i.e. only seven inverter modules are needed to drive 14 servo axes on the spinning machine. "The new drive solution allows us to significantly reduce the acquisition and operating costs of the machine," shares Li Tianwei, technical manager of the Pacific Group. Li Tianwei states that an important and decisive criterion for choosing the B&R drive system is the ACOPOSmulti feature of active power regeneration. Here,

the kinetic energy generated from breaking is converted into electric energy and fed into the power supply system.

Increased flexibility using electronic cam profiles

The task of the controller is to guarantee optimal processing of different types of yarns and, therefore, high-quality spinning results. Whereas earlier machine generations processed yarn controlled by mechanical cam profiles, today the process is controlled by electronic cam profiles. In the course of this completely new procedure, all significant production parameters like yarn properties, yarn tension, spindle speed, acceleration, etc. are integrated into a mathematical model.

All necessary process variables can be easily configured by the user on the Power Panel. The controller also calculates the corresponding drive parameters and, by executing the mathematical model, generates the modified cam profiles



"The new drive solution allows us to significantly reduce the acquisition and operating costs of the machine. The efficiency of the production process for the end user was significantly increased."

Li Tianwei
Technical Manager
Pacific Group

that are processed directly on the drive. The use of this technology makes the complete spinning process simpler and more flexible while increasing quality.

Compared to a normal mechanical cam profile, the process sequence for spinning is designed using especially advantageous electronic cam profile technology, thereby eliminating maintenance procedures on the previously used mechanical components.

Perfectly synchronized with POWERLINK

A fast and reliable communication medium is very important due to a high number of axes and a need for fast data exchange from all control compo-

The new machine generation makes the entire spinning process significantly easier and more flexible, while simultaneously increasing quality.





The POWERLINK-networked ACOPOS multi servo drives guarantee optimal synchronization of the spindles at highest revolution speeds.

nents. This is guaranteed by the real-time technology of Ethernet POWERLINK.

The spindles run at 25,000 rpm, which requires optimal synchronization of the spindles. Thanks to the use of POWERLINK, efficient data exchange is guaranteed between the X20 I/O system, the controller and the drive units used, thereby achieving the highest degree of synchronization. The minimal jitter levels of POWERLINK also ensure the highest level of precision.

Space-saving and cost-efficient

Compared to shorter spinning machine types, this new construction makes it possible to reduce the size of the head stock and the space required for operation. The integrated doffing element, which automatically replaces fully wound spindles with empty spindles, leads to reduced labor costs for end users. Above all, this is a highly efficient solution which has greatly increased market competitiveness.

Successful partnership

"With the new control and drive solution from B&R, we can significantly

increase the efficiency of the production process for the end user," adds Li Tianwei. "Swift implementation of all machine design requirements and guaranteed in-depth customer service are important factors of success in our project partnership." ■

Pacific Mechatronic Group:



Founded: 1994

Employees: more than 3,000

Turnover: 1,562 m RMB (2006)

Locations: Shanghai (CN)

Products & Services: The Pacific Mechatronic Groups specializes in the development of cotton spinning, synthetic fiber, cord, wool, dyeing and dressing machines

www.china-pmg.com