

Nicely Spun

At first glance, winding tape and yarn doesn't seem to be a very demanding process. However, to guarantee high-quality processing of the wound material, precautions need to be taken during winding to prevent the material from losing its shape or fraying later. To maximize the speed of the strapping machines used for packaging, for example, packing straps always need to be wound as evenly as possible. Special wind-up patterns make sure that the curvature of the strap on the spool doesn't exceed a specific maximum value.

When using tube winding machines which create the support netting for tubes, the hardest possible spun bobbins are required. This means that the material is wound very tightly with a predefined tension level to prevent it from unrolling by itself. This is a demanding task since there are several spools moving at one time on a rapidly rotating drum in a tube winding machine.

Thanks to their high precision and the quality of their winding machines, Dietze+Schell have made a very good name for themselves internationally. The company exports 90% of its products, in particular to European countries, China, the USA, and Canada. Renowned tire producers and manufacturers of industrial textiles use raw materials which have been mass-produced using Dietze+Schell machines.

High quality and a competitive price can only be achieved with sophisticated, flexible automation ideas. With this in mind, Dietze+Schell formed a partnership towards the end of the 1990's with B&R Industrie-Elektronik, a leading provider of integrated automation solutions. B&R offered the exact scalable solutions needed for simple and complex applications while also being able to provide the best ap-

plication support possible. B&R controllers offer a number of technical and price advantages, especially when used together with complex machines. The wide spectrum of solutions – from pure control, over networks and drives to the Industrial PC – provide the necessary flexibility. When developing applications, B&R is known as “the problem



A look at the „brains“ of the 10-headed DS10 from Dietze+Schell. A Provit 2000 Industrial PC controls up to twelve ACOPOS servo axes for rewinding synthetic and spun yarn.

solver”, daring to approach complex applications and tackling them with simple methods.

The requirements of Dietze+Schell's customers are constantly growing. To increase throughput, several spools are often in use at once. Several spools must also be operated synchronously in order to wind up the raw material from multi-nozzle extruders or shearing equipment. Whereas until recently 20-30 spools may have been sufficient, now it is desired to have fifty or more stations networked. Existing solutions were implemented with decentralized controllers networked via CAN bus. Up to a certain size, this concept was acceptable because of the price, and network capacity was sufficient to deal with it. To meet the new requirements, network capacity needed to be increased while reducing the costs of the individual spools in order to keep the entire system reasonably priced.

“There are always several ways to complete a technical task. For this reason, our engineers work in close cooperation with B&R's application specialists when programming the B&R controllers and drive systems in our winding machines. At this point, we are completely satisfied with the cooperation we have received.”

Ulrich Singer, Design Team Leader, Dietze+Schell.

It was decided to use a centralized controller and a distributed input/output system with drives connected over an efficient network. Using the B&R 2005 controller series with a CP3xx CPU provides Dietze+Schell with a scalable solution which can also handle the highest performance demands, even with winding speeds of 500 meters/min. The CP3xx 2005 controller family, based on the Industrial PC concept, provides a powerful tool with task cycle times under 1 ms. It can be used by itself to solve the most complex tasks extremely easily.

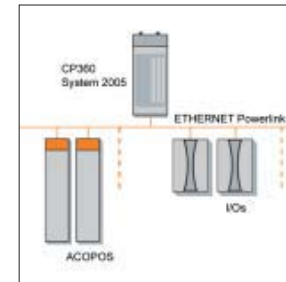


Commissioning of the 8-headed DS10 crosswound bobbin machine with electronic laying system (ACOPOS) for winding speeds up to 1,200 meters/min.




DS10 switching cabinet. One ACOPOS unit is used per spool drive as the spindle drive.

The network is handled by ETHERNET Powerlink which allows transparent synchronization of all systems involved based on the IT standard, Ethernet. In addition, this network provides many opportunities for future expansion. As a manufacturer of special machines, Dietze+Schell places great importance on the flexibility of the automation devices being used. Due to the modular and scalable hardware and software designs, any desired modifications and machine options can be implemented very quickly into the machine's existing basic concept.



The Automation Studio programming system from B&R provides the customer with a software tool for control, motion, operator interface, and communication tasks. All important software functions

such as source level debuggers for testing programs, graphic cam profile editors, and real-time traces for commissioning drives are all integrated into Automation Studio. All programming and service functions can be controlled both locally or remotely over a modem. With these functions, nothing can stand in the way of using Dietze+Schell machines worldwide. B&R's international subsidiaries and partners stand ready to provide end customers with direct, on-site help in case of any emergency. 

16 Application

The VBW strapping winder with a second spool for fast spool replacement. Application range: High performance strapping automat for packages, magazines, and newspapers.



The 130 employees at Dietze+Schell, located in Coburg, Germany, manufacture precision winding machines and finishing systems for the textile, plastics, and glass fiber industries. Founded in 1951, the company first produced packaging machines for candy manufacturers. Manufacturing precision cross winders for the glass fiber industry, which are used to manufacture assembled rovings, opened up the area of man-made fibers at the mid-1960's. Other milestones included air-texturizing machines, direct roving winders, and cake forming winders. Today, Dietze+Schell concentrate on manufacturing series and special machines - from winders for spun yarn and winding packaging straps for strapping machines to texturizing machines for yarn used in brake and clutch linings. Since 1999, they have had a subsidiary in Piedmont, South Carolina, under the name Dietze & Schell Corp.

www.dietze-schell.de



Winders in the VBW series are used behind high-efficiency extruders or cutting assemblies. The winding itself is handled by the ACOPOS cam profile automati.