The Successful Automation in the Chemical Fiber Industry

The engineering office of our company is located close to the historical town center of Augsburg and integrated into the infrastructure of the high-tech metropolis Munich with its international airport, providing connections to our customers all over the world.

With more than 25 years of experience in the field of man-made fiber automation our team is prepared to fulfill all customer demands. Starting with the Barmag automation department in the early 80s the focus was to bring maximum benefit and functionality to the customer at all times. By offering highly sophisticated textile machinery in combination with a state of the art automation system, commonly developed out of one hand for perfect interfacing, the customers already started to benefit from this “turn-key” supply at a very early stage.

Meanwhile more than 60 installations have been supplied to customers all over the world, always providing highest German engineering quality combined with long term reliability. By offering a 24/7 support our staff is prepared to service the customer at any time.

When Autefa Automation, a since long reliable partner for Barmag, took over the business in the mid 90s the world textile market was booming and the increasing demand for automation in spinning mills could be satisfied easily with their experience in customized machine engineering.

By transferring the filament automation division to AC Automation in the year 2009 the next important step into the future was established:

A dedicated and highly motivated team of engineers, logistics experts and design specialists with more than 25 years of automation experience merged with a worldwide network of service stations, cooperation partners and sales centers under the new leadership of the privately owned Atlantic C group of companies.
DOFFING SYSTEMS FOR SPINNING MACHINES & DOFFING OF TEXTURING MACHINES

Doffing Systems for Spinning Machines
The doffing process is the first step of automatic filament handling lines. Since the doffing system is directly connected to the production machines, its design must adapt to the best possible way to the surrounding operating conditions. This means matching the needs of different winder types as well as granting operator safety in the working areas.

KEY FEATURES
- availability >99%
- laser scanner for maximum operator safety
- unrestricted operator movement due to more than 1 m distance “doffer to winder”

Doffing of Texturing Machines
For the automatic doffing of modern automatic Texturing Machines AUTExA filaments - Systems offers the use of a floor based AGV (Automated Guided Vehicle) system. This system does not require any mechanical rails or guiding, which would interfere with the daily manual operations in this area.

By automating the POY supply and the DTY doffing, texturing can easily be connected to POY production via an AUTExA filaments Systems intermediate storage.

This offers a completely new concept of automation and quality control for plants with POY production and downstream processes, using the advantage of non-stop product tracking starting from the raw material up to the DTY bobbin onto the pallet.

KEY FEATURES
- flexibility
- independent
- highly efficient with loads up to 72 bobbins
- redundancy

Multi Doffer – MD1
The MD1, based on Automated Guided Vehicle technology, is a doffing and transportation system for automatic spinning installations combined in one unit. The advantages of this concept are:
- Flexible assignment to spinning lines according to demand
- Highest possible redundancy
- Integrated transportation activity
- Suitable for low room heights

BCF Doffing
The FDD-System was specially designed for the very short running times in a BCF production and is also able to supply the winder with empty tubes.

DTY-Multi Collector 1 AGV
The MC1 Multi Collector loaded with DTY bobbins heading for the Unloading Buffer. Large safety reels allow safe operation under any working conditions.

Suspended Doffer System – SD1
The SD1 is a doffing system for automatic spinning winders, including automatic winder chuck detection. Optional automatic paper tube donning is available. In order to prevent yarn breaks the doffer master control even considers different parking times of each single winder possibly resulting from different spinning parameters.
The second step after doffing is the transportation of the bobbins to intermediate storage or in some applications directly to the packing system.

AUTEFA filaments - Systems offers two different basic concepts in order to achieve this functionality:

**BRS**
Automatic overhead transportation by means of the AUTEFA filaments - Systems Bobbin Railway System (BRS). The Bobbin Railway System is mainly used in combination with the AUTEFA filaments - Systems SD1 doffer system.

**AGV**
An alternative is the use of floor based Automated Guided Vehicles (AGV). The AGV system applies a combined doffing and transportation function.

AGV systems are of advantage especially in plants with low room heights, when it is not possible to install a suspended transportation system in the overhead region safe for the personnel.

**KEY FEATURES**
- Integrated inspection & laboratory
- Single platform for data and quality management
- Error free data and product tracking

**BRS-System**
A BRS (Bobbin Railway System) carrier loaded with POY bobbins. The overhead transportation offers several advantages like high throughput capacities and no interference with transport ways.

**Bobbin Weigher**
Precise weight determination of each bobbin in a doff by the fully automatic bobbin weigher including automatic calibration of weighing cells. The precise data allow for weight cross-checking to detect temporarily jumped filaments.

**Quality Control**
Online bobbin inspection in the visual inspection station. All data is transferred online to the main server of the installation. Thus an immediate feedback signal can be submitted to the production area in case of quality fluctuations.

**Multi Feeder System – MF1**
The MF1 automatically replaces empty POY cassette creels against full ones at the texturing machine. Its design corresponds exactly to the requirements in the machine aisle.

**Creel Cart Loading & Unloading**
Creel cart loading & unloading station with integrated pre-sorting buffer.
Tilting Unit

The Tilting Unit is our most effective store-in device for highest throughput. The bobbins are taken directly from the monorail system.

Store In/Out Area

The store in/out area type for highest flexibility is equipped with 6-arm jointed robots which are well-known from the automobile industry. These single-robot-cells combine storing-in, storing-out and sorting of the bobbins with a minimum of hardware. Even various tube sizes and diameters can be handled within the same robot-cell without extra equipment.

MULTI TRAY STORAGE SYSTEM

The third step of an automatic filament handling line is the intermediate storage. Since this field can be considered as the heart of the automatic filament handling system, its design determines an essential part of the flexibility, efficiency and reliability of the entire installation.

Today these successful systems, patented by AUTEFA filaments - Systems, are operating in many spinning and texturing production plants around the globe. The Multi-Tray Storage provides several significant advantages in comparison with other available intermediate storage systems.

KEY FEATURES

- compact intermediate storage for large bobbin quantities
- fully automatic inventory
- worldwide patented system

Multi-Tray Storage

Aisle view of a Multi-Tray Storage providing highest storage capacity with unlimited length and adaptable height up to 11 meters.
The packing line is the fourth step of an automatic filament handling system. Here the highest degree of customization is required. Therefore it benefits most from AUTEFA filaments - Systems’ general design concept. The end-user’s requirements regarding bobbin packing and box palletizing are extremely variable. By using well proven strategies AUTEFA filaments - Systems manages to accommodate all packing requirements with minimum hardware efforts.

The packing concepts and the packing machines provide the key to the effective realization of these highly customized systems often resulting in reduction of packing material combined with lower shipment costs.

Dense Packing System
The sensational “Dense Packing System” for DTY bobbins and similar products using a 6-axis jointed-arm robot, well-known from the automobile industry, and highly sophisticated software to place each single bobbin in accordance with a pre-calculated pattern. Optimal use of the available space guaranteed, regardless of the bobbin’s diameter.

Box Array Palletizing
Palletizing of small boxes onto a shipping pallet. Any pattern can be arranged on request due to the flexibility of the modular design concept.

Bobag
Individual film bagging of bobbins suitable for high throughputs. In this case the proven reliability of our machines is in demand.

Wing Pad Cover Robot
Top covering of a filled box with a wing pad. Automatic opening of the folded cartons is integrated in the gripper head.

Automatic Packing Robot
The packing robot with automatically adjustable grippers places bobbins onto a pallet. The packing material is handled by a second gripper head to achieve a higher throughput.

KEY FEATURES
- No touch = no damage
- Perfectly built even pallets
- Human error eliminated
- Also available as standalone package with packing from creel cart
In order to simplify warehousing, which is often very time and space consuming when done manually, and to integrate the storage management into the automatic product flow, the delivery range is completed by a fully automatic high bay storage system with a connected commissioning sector for truck loading.

**KEY FEATURES HIGH BAY STORAGE**
- Integration of local supplies
- Direct link to ERP system

**Final Touches in Packing**
The packed pallet is made ready for dispatch in the finishing line i.e. closed, weighed, labeled and finally supplied to the commissioning area via a delivery buffer. Due to open interfaces, every packing suitable for automatic operation can be realized.

In the finishing line one usually finds the following steps:
- Carton covering of pallet
- Top wrap feeding
- Weighing
- Labeling
- Wrapping
- Plastic film strapping
- Shrink hoodsing
- Stretch hoodsing

**KEY FEATURES PALLET FINISHING**
- No touch = no damage
- Perfectly built even pallets
- Human error eliminated
- Also available as standalone package with packing from creel cart
### CUSTOMER | LOCATION | SYSTEM TYPE | BOBBINS PER DAY
--- | --- | --- | ---
Sanghi | India | Fully automatic spinning plant | 8000
Indorama | India | Fully automatic spinning plant | 7800
Hyosung | Korea | Automatic POY packing system | 8400
DuPont | Germany | Automatic POY storage/packing system | 15000
Saehan | Korea | Fully automatic spinning plant | 20000
San Y | Taiwan | Fully automatic texturing (AF/P) plant | 30000
DuPont | Brazil | Automatic POY dobby packing system | 8000
DuPont | Great Britain | Automatic POY transportation system | 6000
Lee Fa | Taiwan | Fully automatic texturing (AF/P) plant | 30000
Zhong Sheng | Taiwan | Fully automatic spinning plant | 13500
FCC | Taiwan | Fully automatic spinning plant | 8700
Nan Ya | USA | Fully automatic spinning plant | 25000
Nyllex | Mexico | Fully automatic spinning plant | 9000
Hoschat | Germany | Automatic POY dobby system | 4000
ShinKong | Taiwan | Fully automatic texturing plant (AF/P/TFX) | 24000
ShinKong | Taiwan | Fully automatic spinning plant | 9000
ShinKong | Taiwan | Fully automatic spinning plant | 10000
ShinKong | Taiwan | Automatic DTY packing system | 4500
Stoan | USA | Fully automatic spinning plant | 11500
Electa | Turkey | Automatic line cond dobby system | 24000
Niit | Israel | Automatic POY dobby system | 1800
DuPont | Germany | Automatic BCF storage/packing system | 26000
DuPont | Mexico | Fully automatic spinning plant | 28000
Nan Fa | Taiwan | Automatic DTY packing system | 30000
NYK | USA | Automatic POY dobby system | 15000
Britten | Spain | Automatic POY dobby packing system | 15000
Niit | Israel | Automatic POY dobby system | 32000
Lei Fa | Taiwan | Fully automatic texturing (AF/P) plant | 30000
DuPont | Great Britain | Fully automatic spinning plant | 6000
TWO | Germany | Fully automatic spinning plant | 7000
Val Lexima | Italy | Automatic POYDY packing system | 6000
STFC | India | Fully automatic spinning plant incl. balepallet soft | 15000
Niit | Israel | Tat turning station | 6000
Glanzeff Bohemia | Czech Republic | Inspection loop | 7000
Borma | Belgium | Fully automatic bale transport | 6000
SASA | Turkey | Automatic POY dobby system | 9000
Indorama | India | Fully automatic spinning plant | 30000
Niit | Israel | Automatic POY dobby packing system | 5000
STFC | India | Automatic POY dobby system | 15000
Ten Cate | Netherlands | Extension, Transport, packing & overhousing system | 13000
Technopartners | Netherlands | Artificial grass bobbin handling | 15000
Boyd | Switzerland | POYDY automation system | 12000
Technofiber | Luxembourg | Automatic POY dobby packing system | 5000
FEP | Great Britain | Glass fiber bobbin handling | 15000
Invista Camden | USA | BCF packing automation | 30000
Alatai | Italy | Fully automatic texturing plant (MP3) | 6000
Lee Fa | China | Fully automatic texturing plant (AF/P) | 30000
Blicken | Germany | Technical yarn automation system | 3000
Seiden | Slovakia | Fully automatic POY plant | 7500
Slovak | Slovakia | Fully automatic technical yarn plant | 4500
Invista Gloucester | Great Britain | Automatic packing system | 11000
Alok Industries | India | Dobby & Packing Automation – POYDY | 11000
Zhejiang Shengyuan | China | Fully automatic POY plant | 30000
Zhejiang Shengyuan | China | Automatic POY dobby system | 25000
Niit | Israel | Automatic POY dobby system | 32000
SumTex | India | Automatic POYDY dobby system | 20000

### INNOVATIVE SOLUTIONS FOR INDIVIDUAL REQUIREMENTS

ATLANTIC C GmbH, the mother company of AC automation, is your partner if you wish to establish logical production processes.

ATLANTIC C has a team of experts with over 15 years of successful project work in plant engineering for the beverage and the food industry as well as for the non-food industry. ATLANTIC C GmbH plans, designs and integrates your filling and packing lines, display automation and storage systems. Additionally the company provides advice in all questions regarding optimization of product flow, investment preparation and cooperation, merging and site evaluations etc.

According to Mr. Rolf Gänz, owner & managing partner of ATLANTIC C GmbH as well as AC automation GmbH, the companies’ main focus lies in finding the ideal solutions for their customers.

**New Intralogistic and Design Department**

By purchasing an intralogistic department and founding a subsidiary in Augsburg, Germany, in the year 2009 ATLANTIC C GmbH has considerably increased its worldwide activities. The highly specialized filament automation complements the existing know-how with design, database and logistic experts with long-term experience.
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