

Flexible, fast and safe in process

High flexibility on simultaneously low production costs plays a decisive role in the furniture industry. Many suppliers are increasingly focusing in intelligent production of high tech batch size one lines, combined with appropriate transports and storage systems, an optimal material flow and automatic panel handling instead of simple mass production. In the third part of the HK series „Homag Spotlight" logistics, storage, automation and robot solutions at furniture manufacturers are in the center of attention.



At Recor, 3 robots are palletizing and thus care for an automatic panel flow from delivery to labeled packages



Where in the past quality costs were high due to material damaged in production, and process flows were often disturbed, when manufacturing was controlled by minimum stock levels and large storage systems generated high costs, financial controllers and production specialists stepped in. With the attempt to optimize the inventory-to-sales ratio, in order to lower the costs and, at the same time, reduce throughput times.

At first, this attempt seemed far from reality. However, with the right know how and skilled experts things will become realistic. Such skilled experts can be found in the HOMAG Group Engineering. The magic word is "production per commission". Decisive are understanding for logistics and automation, an optimal sorting during production processes, a suitable production management system and the material flow control. In this field, Homag Group has the necessary premises for linking individual machines and production cells to intelligent plants. Productivity and efficiency in the company can significantly be increased.

Who wants to be continuously successful needs a batch size one production, which convinces through adequate logistics. Seen on their own, operating machines are efficient value creators. Whether it's about saws, edge banding lines or CNC-processing centers of the Homag Group — they all score with precision and homogeneity in material processing. Therefore, it is a challenge for many companies

to link their machines efficiently in a logistical master plan to produce flexible, fast and reliable on a high quality. Whether a small carpentry or a big kitchen manufacturer, all apply to the same principle: "Factor time" x "factor quantity" x "factor quality" = "effectiveness of the complete line".

At this point the experts for automation and logistics of the Homag Group, Bargstedt and Ligmatech, step in. Bargstedt offers logistical solutions especially for the individualization trend in the furniture production, which decisively optimize flexibility and utilization ratio of a production process. Starting point: The material flow depends on the speed of the operating machine, instead of the operating machine being dependent on the material flow. Only an optimally controlled material flow ensures high productivity. In this add also Ligmatech's flexible robot solutions. They offer innovative feeding and destacking systems or pick & place-applications, to achieve high performance on maximal repeat accuracy and precision. These robots are easy to operate, because they are integrated to the line control and score with high availability and operational reliability. More than 200 realized applications speak for themselves.

Bargstedt's horizontal storage systems give users an enormous leeway in individual solutions, especially in combination with operating machines. Fast, automatically and precisely, panels are stored and removed, collated or

fed to further processes. All Homag Group machines may easily be integrated due to standard links. Furthermore, it is possible to realize a material return via full integrated transport systems due to these link compatibility. So, offcuts are gently returned and automatically managed to the storage. This noticeably relieves operators and reduces material costs. Offcuts are directly available at the next optimization. In addition, the storage software „Woodstore" guarantees automatic material management from new parts up to offcuts. All stored offcuts are registered as planable stock for the optimization. The storage management offers the operator a clear display for manually stored offcuts. Removal lists may easily be created and printed.

The company Georg Meyer Tischfabrik with its managers Dirk and Frank Witte is using a Bargstedt horizontal storage system. Their conclusion: "Where, in the past, we laboriously had to handle different panel material with their great decor variety via high bay racking and fork lift truck, nowadays it is automated to a large extent. Today we get an overview over the stock only by pressing a button. Handling times have become considerably shorter."

After a Holzma saw has cut the panels they are transferred on transport conveyors to a Homag format and edgbanding machine. First challenge: Saw and edge banding work with different cycle capacity. Bargstedt attends for it

BARGSTEDT offers the matching solution for a highly efficient format and edge processing with its dynamic edge circulation unit TFU220 and thus provide the prerequisite for a flexible furniture production



STATEMENTS

That's what are saying Homag Group customers and experts



Uwe von Allwörden, Project manager at Homag Group Engineering

Uwe von Allwörden has been employed at the Homag Group for 25 years and has experienced many and far-reaching changes in this industry. He started in the Service Center

and is for 10 years project manager in the Homag Group Engineering. He visited many customers who are using Bargstedt storage and handling systems — in North and South America, Asia and Europe. During his career, Uwe von Allwörden had already more than 10 000 customer contacts — and thus has a broad knowledge in his working area.

For 25 years you have close contact to customers all over the world. What has changed in view of machine technology and also at customer's site?

In recent years we noticed a clear trend in intralogistics concepts developing away from stacks towards small packages and individual parts. The demand is for solutions for realization of a "one piece flow", to reduce tied-up capital in production as well as through-put times. Taking the architecture of our customers supply chain into consideration, it is for us as handling specialist not only about "just in time" production, rather the development shows tendencies towards a "just in sequence" philosophy. Also, the demand for information has drastically changed, especially through media like the Internet.

Whereon do you notice that?

When I was traveling in Poland during the 1980ies, a contact to my company was only possible every few days via telex. Now, one receives already a reminder, if one hasn't answered an e-mail within a few hours. Our customers have to face these changes, too. So, always shorter throughput times in production are an important aim that must not be ignored on planning of a new production. Some companies only sell via Internet, where furniture have a delivery time of only 24 hours. For this reason also the demands of end customers are rising.

What are today's challenges for machine manufacturers, and, what do you think, where is development heading in automation?

Today, it is our demand to develop affordable machines for all market segments so that also a handicraft enterprise may partly be automated. For a long time now, individual production islands are automated by robots in the automotive industry and linked to intelligent transport systems. Due to the demanded automation degree the investment proportion for handling within individual production cells and their interfaces may sum up to 50 per cent of the total investment volume. In the past this proportion was between 15 and 30 per cent. In this respect intelligent material streams are important, which are only enabled through a continuous data management, and a project team that develops solutions by design. In this respect the use of dynamic buffers/sorters is essential to achieve a concentration to the value creating process and thus a maximal output.



Bakhtiar Alshekani, Production manager at Loosli Badmöbel

The Swiss bath furniture manufacturer faced a great challenge last year in his Wyssachen's factory: Production in small series was, in fact, efficient but had

caused a time-consuming disarrangement in the delivery storage. To optimize processes an up-to-date storage system should be provided. Production manager Bakhtiar Alshekani remembers problems — and how the new Bargstedt collating station „TLB 320" brought order to it.

What was the reason for you to co-operate with Bargstedt and the Homag Group?

Only a few months ago a more or less chaos reigned in our dispatch storage. Loosli is producing small series to organize an effective and economical production. It may well take a few days until all parts of an order are produced. During this time, individual batches were pre-stored according to delivery days - here and there without a fix order. Collecting was each time a real challenge. Unfortunately, very time-consuming.

What has changed?

Our production is still the same. At the interface between final assembly/packaging and delivery hall much has changed due to the new storage. Now we have a storing capacity for a four week's production in two 28 meter long and 9.80 meter high storage alleys with each 23 stories — when production is running at peak levels. At the moment we are a bit away from it but Loosli notes a continuous increase for years. So, the new storage must also be able, to deal with increasing production capacity.

How did you achieve this aim?

After assembly and packaging, our furniture are stored. A scanner senses panels for the bar-code. The system determines size and dimension of panels and defines the optimal storing position in the shelf according to different shed sizes. We are able to store 80 parts and remove 240. It was important for us that the system works so precisely on depositing and lifting that damages at the furniture are excluded. Now, the registering software enables that not only parts from current orders are registered, stored and finally delivered per lot. Additionally, also standard furniture are managed which are, in case of necessity, allocated to a customer order.

with the series "TLB" (Transport-Lager-Bedieneinheit) (transport-storage-operating unit). Here was created a full automated high bay racking that is used as buffer between two operating machines. On the one hand the "TLB" absorbs different cycle capacities, and on the other hand, guarantees that the format and edge banding is provided with a material flow that is harmonized to its cycle. The capacity of the buffer is already calculated in the project planning and configured according to the requirements. Otto Breitschopf, Head of production engineering at König + Neurath in Karben, means: "We were convinced especially by the simplicity of the system in the Bargstedt solution which uses gravity to a large part."

The destacking behind the saw is another Ligmatech robot's specialty. On this counts for example the furniture manufacturer Recor in Belgium. Here, LIGMATECH produced even two individual customer solutions that are unique in their own way. Three robots destack the panels after cutting with a Holzma angular panel cutter. In this, the first robot optimally splits the panel flow in two destacking levels and, if needed, turns them. Two downstream robots destack on each four places. Even small series may be destacked in more story layer arrangements in the flexible line - and this without manually equalizing different package heights in a layer.

After the Homag format and edge-banding panels are transferred on transport conveyors to the collating station where they are stored chaotically before entering the WEEKE throughfeed drilling machine. Material is already exactly positioned when taken from the transport belt in order to save space and fill shelves best possible. Incoming part streams are separated, sorted and prepared for the next process in an ideal order. Different removal strategies automatically fit the sorting order to customer's requirements. So, users can decide whether

At Swiss' bath furniture manufacturer Loosli a Bargstedt collating storage manages the organization between production and removal

lots are built by factors like set-up time, assembly order and tour plan, or color, shape and material. Furthermore, the unique designation of each component enables transparently callable information to the operating status and position in the line.

At Austrian's company Hali such collating storage is installed between edge banding and drilling additionally to other logistical components. It has five alleys and a capacity for 6 000 parts. There, the shelf system serves for buffering and collating of components for corresponding assembly lines in assembly and tour order. When the day lot is complete in the storage, the lot related removal and provision of two downstream drilling machines starts automatically where panels are processed and conducted to assembly and packaging. Hali manager Albert Nopp: "Currently the collating station is storing about 3000 to 4000 panels per day in a two shift operation. The system runs smoothly despite the high dynamics."

A storage can have many functions; as horizontal storage, as sorting magazine or as buffer. Bargstedt's logistic solutions kick in also after assembling of finished furniture and serve as interface for delivery. So, finally assembled corpus parts are forwarded via transport distances in a collating station after the final assembly/packaging, intermediate stored for delivery and

sorted per commission for shipping. Even here, at the end of the production chain it is automatically sorted and with this the effectiveness of the complete line is positively determined. In the central "goods dispatch area" at Ballerina Küchen a robot is sorting fronts per lot which are coming out of Bargstedt's storage into a special trolley. The moment of dispatch is electronically controlled due to the delivery time of the finished kitchen.

Robots can flexibly be used on handling at CNC-BAZ. Benefit: Planable and continuous production, higher capacity and a noticeable relief for the staff. Michael Neuburger from subcontractor Rushi cites as reason for investing in a robot feeding for their Homag's CNC processing center „BAZ 722": "As subcontractor we are under time and cost pressure. Therefore, we were seeking a solution which is able to process also quantity in batch size one in mixed stacks with high process safety. It is clear to us that we will go for robot automation on future investments."

Ligmatech developed a solution that has never existed before. At the Belgian Recor, custom-fitted packaging materials are individually cut, i.e. each according to furniture parts to be packed, at fixed positions and fed to the corresponding packaging line. In doing so, three robots arrange for an automatic part flow - from delivery up to labeled packages.



Photos: Homag Group