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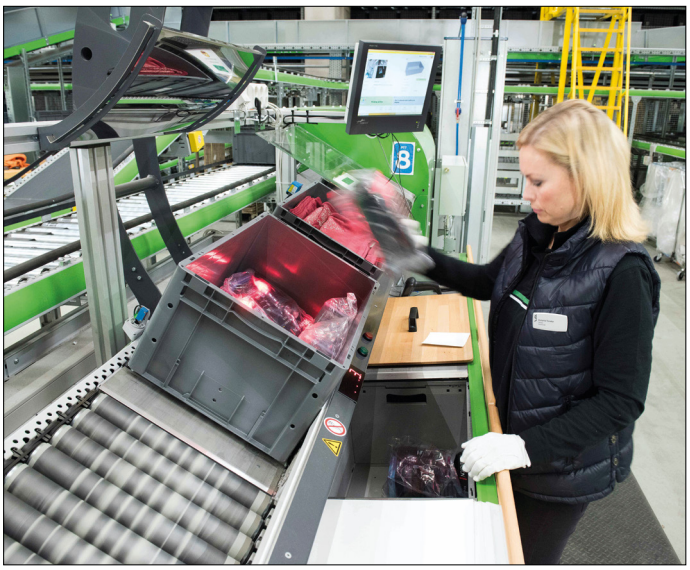

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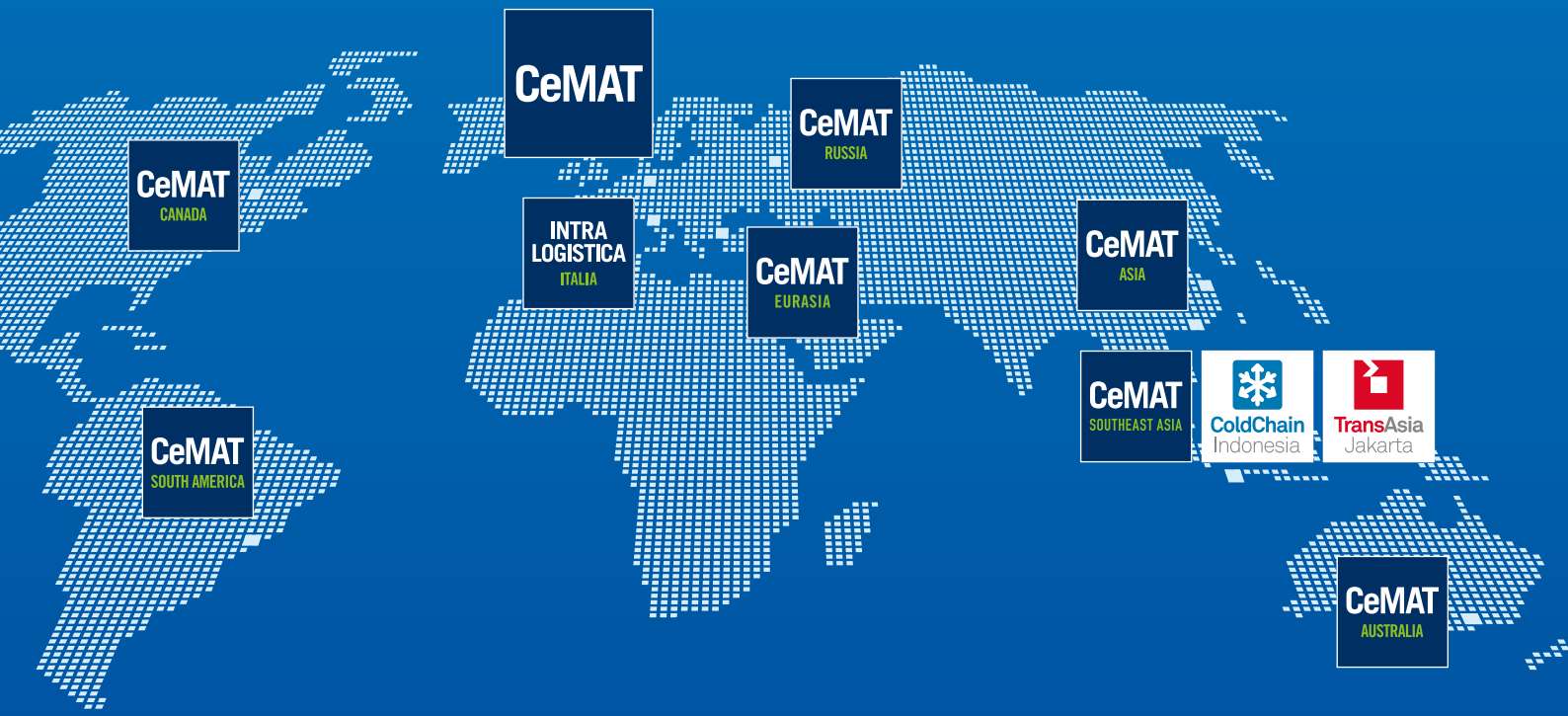

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Globalization made in China

At the Asian regional forum in Boao, Zhon Wenzhong, General Secretary of China's counterpart to the Davos World Economic Forum, warned that globalization is in a critical phase. Chinese head of state and party leader Xi Dingping had already pointed to dark clouds for free world trade in his speech at the World Economic Forum in Switzerland. This could give the impression that in the Trump era of economic nationalism, China is rushing to the aid of the open global economic system. But the role assigned to the Middle Kingdom in concert with the global economy as presented by China's elite in Boao and Davos is not very credible. That's also what the Mercator Institute for China Studies (Merics) thinks. According to the institute, complaints about lack of market access for foreign investors have actually continued to increase in the recent past. The Chinese initiative for a "New Silk Road" also forms part of this picture. Russian President Vladimir Putin and other heads of state and party leaders met at the Silk Road Summit May 15 and 16 in Beijing. The agenda of the meeting included a presentation of details of that initiative. In specific terms it has to do with traffic routes from Asia to Europe and similar ventures – financed with Chinese billions and built by Chinese companies. This is globalization made in China – open markets, but only when it works to China's own advantage.

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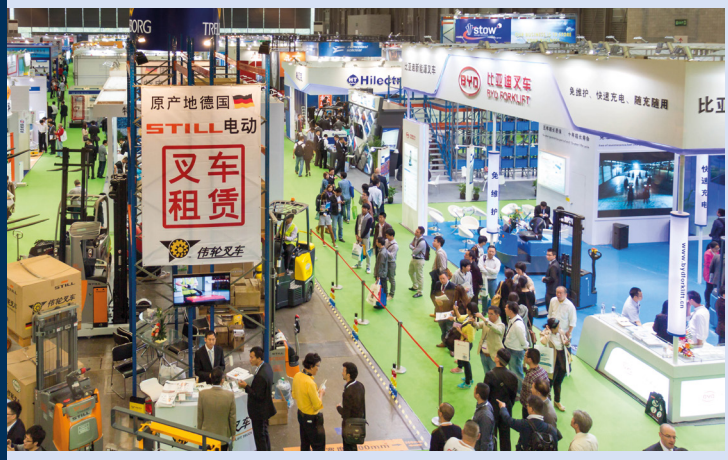
9th year (2017)

Great opportunities to do business



The Cemat is worldwide on an expansion course. Two new regions have already placed on the international event calendar this year. We asked Krister Sandvoss, Global Director of Cemat Worldwide about the strategy and the background.

In 2017 Cemat will take place for the first time in the regions of Indonesia and Canada. How do you justify this decision, what is your motivation?

Both events follow our strategy of introducing the Cemat brand in markets with the most potential for our customers. The timing for the premiere of Cemat Southeast Asia (Jakarta) in March 2017 was excellent, because the Indonesian government is currently in the final stages of new infrastructure projects in Java, Sumatra and Borneo, all of which offer business opportunities to companies from the Cemat branch. The new Cemat Canada (25–28 September 2017; Toronto) will take place in Ontario at the center of the Canadian automobile industry. Fiat Chrysler, Ford and General Motors collectively operate six plants in the province that produce mainly for the U.S. and overseas markets, and many of their suppliers also maintain production facilities in Ontario. Here we see another great opportunity for our Cemat exhibitors to do business.

Cemat is thus on a worldwide expansion course. Which countries and regions do you have in mind for the future?

We already organize Cemat events in Asia, Australia, Europe, and North America. We constantly evaluate the global market regarding potential for new Cemat events, but we prefer not to speculate. I will just say that when we identify good opportunities for our customers in additional countries or regions, then chances are you will see a Cemat there, too, in the future.

From 2018 on, Cemat in Germany will take place in parallel to Hannover Messe – for what strategical reason?

The demand in industry for customization, flexibility and responsiveness continues to grow. This exerts tremendous pressure on manufacturers to develop ever smarter supply chains. The only way they can do this is with the expertise of Cemat's Intralogistics 4.0 experts. So, Hannover Messe is recognized worldwide as the home of Industry 4.0. Now Cemat reinforces the program with intralogistics for smart factories. The co-location introduces exhibitors from both shows to an expanded base of potential customers from around the world. For visitors, the combination delivers a complete overview of the industrial value chain, especially in the industrial automation halls that showcase networking, autonomous systems and self-organizing manufacturing.

What is the position of intralogistics in this new constellation with Hannover Messe?

Beginning in 2018, Cemat will occupy the northwest corner of the Hannover Fairgrounds, wrapping from Hall 19 to Hall 26 and connecting directly to the automation halls. Both shows retain their unique branding. For example, we will produce separate tickets, but a Cemat ticket will also be valid for Hannover Messe and vice versa. The co-location creates many cross-marketing opportunities for us on both the exhibitor and visitor sides. With Cemat parallel to Hannover Messe, we now have a single, global platform that unites industrial technology, energy systems, and intralogistics and supply chain management. At one time and place, visitors will find the complete range of trends and innovations as well as solutions for their businesses.

The worldwide key theme of Cemat is 'Smart Supply Chain Solutions'. Can you explain, what is inside this statement?

The idea behind "Smart Supply Chain Solutions" is this: Logistics is a building block of Industry 4.0, because accurate, flexible supply is essential to all producers of goods. Soon, every parts container, every rack, every materials handling and transport system – even every item of material – must be able to communicate with its environment: machines, robots, accounting and inventory systems, etc. Cemat presents automation and integrated control solutions for smart, digital logistics processes. This extends far beyond mere logistics optimization solutions; we are talking about revolutionizing entire value chains and creating completely new business models. Cemat plays a vital role here, because it is the only trade fair that provides a global overview of technology trends in the industry.

MULTIMEDIA CONTENT

Watch the video interview with Krister Sandvoss, taken in Jakarta by our editor

The questions were put to Krister Sandvoss, Global Director Cemat Worldwide Deutsche Messe AG, Hanover/Germany by Holger Seybold, editor World of Industries – Intralogistics & Distribution

Photographs: *Deutsche Messe AG, Hannover Fairs Turkey Fuarcilik, World of Industries*

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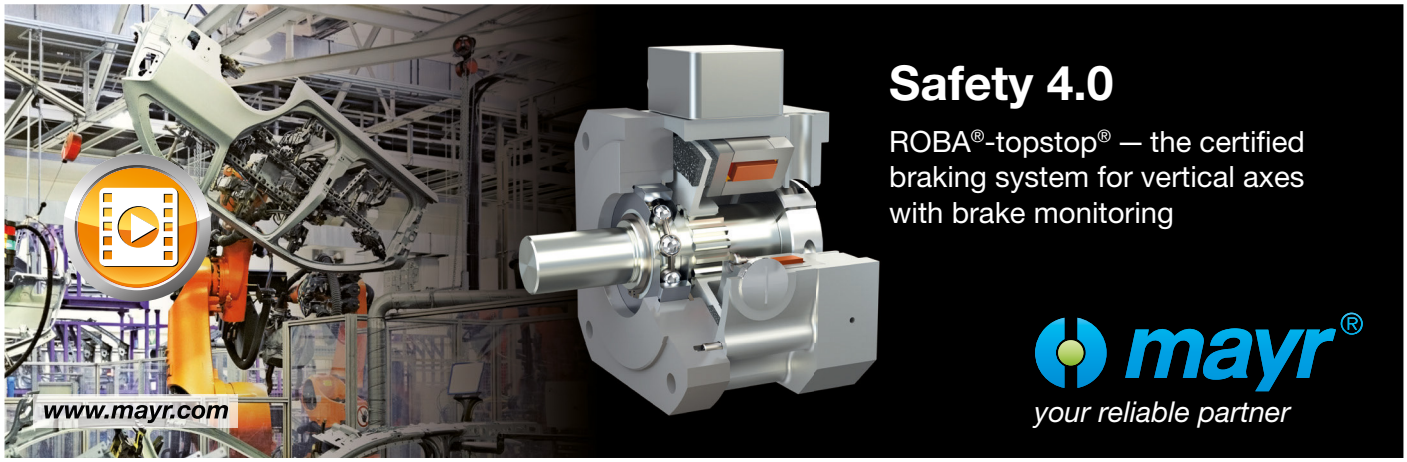

Unlocking South America's potential

The South American region is a diverse kind of an emerging market. It offers a growth potential which is faster than most western economies and a consumer base with higher per capita income than most of Asia's emerging markets.

South America stretches from the Panama isthmus to the southern-most tip of Chile and Argentina. The largest countries in South America are Brazil, Argentina, Venezuela, Colombia, and Chile. As of 2015, the region had a combined GDP of more than $ 3.5 trillion. These economies are driven largely by production in the commodities sector like oil, silver, copper, iron ore, zinc and lead. All of the countries in the region are either a developing or an emerging markets. For a lot of companies today, South America forms an intrinsic part of their emerging market strategy. This is not surprising at all, as the region offers the potential to reach more than 400 million consumers.

Economic snapshot of Latin America

In 2015, South America's economy was almost stagnated and is estimated to have contracted by more than 1 % in 2016. The contraction in the region's economy in 2016 was deeper than expected mainly due to the combined effects of lower commodity prices and capital outflow as the commodity super cycle came to an end. South America is one of the largest producers of commodities in the world. As a proportion of total global production, it produces 40 % of copper and 15 % of iron ore and it is not surprising that the region's fast-

Author: *Sushen Doshi, Correspondent India, World of Industries*

est growth period was during the commodities boom between 2002 and 2008. Due to the sharp drop in commodity prices, particularly after mid-2014, many countries experienced a substantial drop in revenues and a massive outflow of capital. As a result the region's economic growth and investor confidence weakened. This also increased the fluctuations in the currency markets, causing severe recessions in Argentina, Brazil, Colombia and hyper-inflation in Venezuela.

Forecast for 2017

After a setback in 2016, South America's GDP is projected to increase to 1 % in 2017 and more than 1.5 % in 2018. The region is expected to return to steady and solid growth from 2018 onwards. 2017 began on a slightly positive note, but the picture isn't rosy yet, as some risks loom over the horizon. Although Brexit has no direct impact, the negotiations between the UK and the EU have the potential to disrupt global financial markets and impact currencies in Latin America. Another downside risk to the region is the tightening of monetary policy in the U.S. Higher interest rates in the U.S. could increase capital outflows in South and Central America, triggering exchange rate fluctuation in the region, leading to economic contraction. The impact of Trump's protectionist policies will fall mostly on Mexico, given the deeply-integrated trade and business cycle links between the two countries. South America doesn't appear to be on Trump's radar. But the region's agricultural exports to the U.S. could be severely damaged due to these protectionist policies of the new U.S. administration.

Let's take a look at the current scenario of major economies in South America individually.

Argentina: growth in private consumption

Argentina is showing some budding signs of economic recovery. A strong growth in automotive and some areas of fast moving consumer goods sectors is giving rise to increased industrial activity. The economy will bounce back this year as lower inflation will support private consumption. Moreover, the economic reforms being implemented will reinforce the business sentiment and drive up investments. Analysts foresee the economy expanding 3.0 % in 2017 and 2018.

Brazil: rise in industrial production

Towards the end of 2016, Industrial production in Brazil recorded the fastest growth in over 2 years, suggesting that the economy is heading towards a recovery phase. At the onset of 2017, signs of improvement continued to emerge, with rising business and consumer confidence. But, the growth and recovery will be small as the government's austerity measures will hamper domestic consumption. Analysts see GDP growth at half a percent in 2017 and around 2 % in 2018, if the political scenario remains stable.

Colombia: higher oil prices boost growth

In general, 2016 was a bad year for Colombia's economy, mainly due to a collapse in global oil prices. However, towards the end of 2016, a recovery in oil prices saw an upswing in Colombia's exports. The growth in industrial production remains stagnated and consumer confidence continues to sink. Supported by higher global oil prices in 2017, fiscal loosening policy and inflation now being under control, Colombia's GDP is likely to grow to 2.4 % in 2017 and 3 % in 2018.

An overview of South America's logistics sector

With increasing globalization, the role of logistics as a parameter for economic performance and competitiveness keeps on increasing. The impact of logistics costs on competitiveness, productivity, trade, integration and inflation is significant. South American countries are mostly focusing on commodities and export oriented growth strategies. For such strategies to succeed, an efficient logistics network is vital. To unlock its true potential, it will require strategies to overcome the region's complexities. Supply chain managers must first understand the region-specific challenges and then adopt flexible and pragmatic supply chains strategies.

Iguazu Falls on the border of Argentina and Brazil

Challenges

One quick look at a map, and it becomes clear that the region's sheer geographic size presents a challenge. The distance between São Paulo (Brazil) and Santiago (Chile), for example, is 2,500 km, around the same as the distance between London and Moscow. The distance between Buenos Aires and Bogota is 6,800 km, the same distance as from London to New Delhi. The region's natural barriers, like the Andes mountains and the Amazon river, add further cost and complexity to the transport picture. Moreover, rail network is poor and ports are overcrowded. Countries in the region rely heavily on roadways. Road transport is slow and more expensive than rail or ship. All these factors contribute to higher logistics cost. Shipping a 20-foot ocean container from Mexico to Brazil costs about the same as shipping a container to Brazil from China. Also, local transportation is very expensive, it costs more to move a container between major cities in Argentina than it would to ship that same container from Europe to Buenos Aires.

Although the continent as a whole has the characteristics of an emerging economy, it is not a true low-cost region. In South America, logistics costs range from 15-35 % of the product value and even higher for small and medium- sized enterprises (SMEs) at about 40 %. Labor costs, for example, are significantly higher than those of China, up to 3.5 times higher in the case of Brazil. This is true not just for warehouse, distribution center, and factory workers but also for managers and professionals. The cost to employ an experienced supply chain manager in Brazil, for example, is now similar to that in the U.S.

Strategies for success

Despite the above challenges, some local and foreign companies have built extremely successful businesses in South American. A fundamental part of this success is to adapt a region-specific approach to the design and execution of the supply chains, together with targeted investments in the region. Let's review some of the key elements of these strategies.

Increasing localization: The supply chains with a larger local footprints are designed accordingly to meet the requirements of local tax and duty regimes or to overcome import quotas. The benefits of this type of tax-efficient approach can be considerably large, often outweighing the higher costs of local manufacturing. It also allows companies to be faster and more agile in a volatile market.

Split into regional clusters: An efficient supply chain must take into account the long distances, geographic terrain, languages barriers and income differences in South America. As a result of these complexities, most large companies operating here choose to segment their supply chain into regional clusters. Within a clusters, companies must then ensure that purchasing, manufacturing, sales, warehousing, and distribution assets are located in a way that balances cost, service, and local taxation.

Strategies to beat high market volatility: Companies need to create their strategies to suit the market realities. For example, one consumer goods company manufacturing in Argentina, found that supply to Brazil was affected by variations in the time required for goods to clear customs at the border, which varied from a day to several weeks. To minimize the effect of delays, the company monitored border transit times and dynamically adjusted its safety stocks in Brazil, increasing them when border congestion rose and cutting them back to reduce costs as goods began to move more freely. This sort of strategic agility can have a swift and significant impact on supply chain costs and efficiency.

In the recent years most South and Central American countries have realized the significance of efficient logistics networks and have taken some measures to improve this element of their markets. But the region still lags behind. These countries will have to attract heavy investments in the logistics sector in order to improve their competitiveness and integrate in the global supply chain.

Photographs: *Fotolia*


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MADE DIFFERENT

The unstoppable evolution towards collaborative supply chains

The strength of a businesses internal Supply Chain capability is a result of the need to adapt to ever changing market expectations. To cope with today's exponential rate of change an increasing number of businesses are relying on external expertise to innovate and exploit supply chain opportunities. Miebach Consulting believes that collaboration is becoming an indispensable component of leading edge supply chains and the factors that need to be addressed to ensure success.

Authors: *Xavier Farrés, Principal, Miebach Consulting*

Peter Surtees, Associate Director, Miebach Consulting

About Miebach

Miebach Consulting offers consulting and engineering services in the areas of supply chain management, logistics and production. The clients range from medium-sized businesses to global companies that enhance and expand their competitive position with innovative logistics solutions. The Miebach Group, founded 1973 in Frankfurt, today has 21 offices worldwide in Europe, Asia as well as North and South America. With over 320 employees the company is one of the leading international consultants in logistics and supply chain management.

Imagine the logistics directors of a Consumer Packaged Goods (CPG) company and a Retailer discussing how to improve the joint operation of their supply chains. Both are proud of the fact that they have optimized their internal supply chains and agree that they need to collaborate to identify further optimization opportunities. The agenda for the meeting is to review the movement of a range of product categories from the point of manufacture to the store. Mapping the flow of goods quickly identifies an opportunity; products manufactured in the Benelux are being dispatched via a consolidation platform to the manufacturer's European DC and then to the Retailers DC in Southern Germany. The Retailer has a cluster of stores in the Benelux area and analysis shows that circa 40% of the product received from the manufacture is delivered to stores within a close radius of the manufacturers' facility. Obvi-

ously direct delivery from the point of manufacture to the store will reduce transportation costs.

However, as is frequently the case with this type of opportunity, there is no simple solution. The manufacturer wants to deliver full truck loads to achieve internal efficiencies, cost and sustainability objectives. The retailer values the frequency of deliveries to the stores from his DC to achieve his On-Shelf-Availability targets resulting in less than truckload deliveries to their stores. The challenge is to find a mutually beneficial solution that delivers a cost/service benefit case. Further analysis demonstrates that without critical mass, required to deliver the cost and service objectives, the opportunity will be lost. The solution is to invite more of the retailers' suppliers to join a collaborative initiative to combine logistics flows to retain critical mass and frequency.

It is only when the internal capabilities are optimized; the attention of supply chain leaders gradually shifts towards looking outside their own boundaries for collaboration opportunities. Businesses that have already optimized their Supply Chains are frequently those who also operate lean organization structures and struggle to resource collaborative projects.

Why is collaboration so difficult?

One of the UK's largest retailers, in a midst of a crisis of results and under pressure to improve performance, assembled an external team of consultants supported by an internal multi-disciplinary team, to initiate a project to reduce the costs of its private label supply chain. The results after 2 years of work, developing collaborative projects with a significant proportion of its private label suppliers, was a saving of circa GBP700 Million.

During the post project evaluation the team summarized the main challenges encountered developing collaborative initiatives:

- Agreeing how the financial benefits should be shared
- Building trust and enthusiasm to meet the objectives of all of the participating companies
- Managing cross functional & company processes and communications
- The lack of appropriate technology
- The lack of shared KPI'-s to facilitate and measure success

These fundamental challenges explain why collaborative initiatives have such a low success rate and the evolution of collaboration has been slower than expected. Articles published in the CSCMP's Supply Chain Quarterly estimate that only 20% of collaborative projects have provided significant results, and 35% delivered reasonable results. Why invest the time and effort required when the success rate is so low?

However, there are an increasing number of success stories that demonstrate that if you are able to crack the code you can enjoy substantial rewards. No one denies the potential benefits of collaboration, and on the contrary, those benefits are now being identified and realized in more and more cases as businesses learn how to address the challenges.

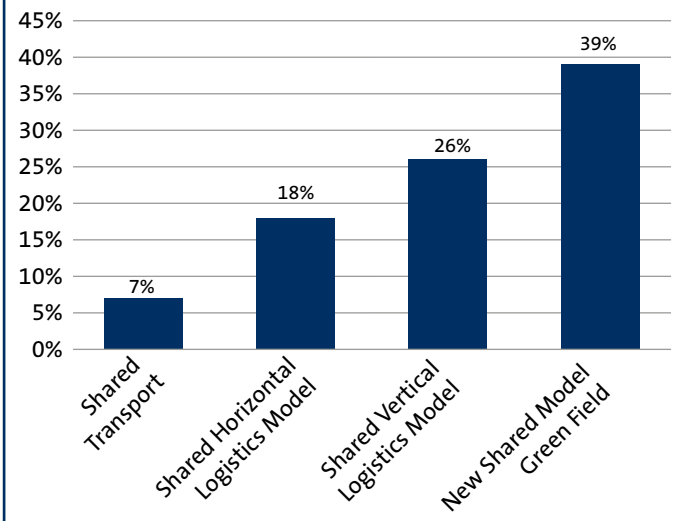
Projects developed and delivered by Miebach Consulting show that, although horizontal collaboration in transport (between companies in the same level in the supply chain) can bring benefits, it is 360º collaboration, especially between several companies, where it is possible leverage greater efficiencies and deliver significant cost savings.

The collaborative benefit case

Miebach's research, supported by successful collaborative projects, concludes that the greatest benefits from supply chain collaboration comes from improvements in truck utilization, increased shipment frequencies, inventory reduction and lower waste. Projects have also demonstrated that the biggest potential for supply chain collaboration is with companies that share similar shipping patterns, which in many occasions is the case between competing companies. In such occasions it is important to ensure that the project meets the requirements of the anti-trust legislation and it may be necessary to appoint a Neutral Trustee to manage sensitive information that cannot be shared by the collaborative companies.

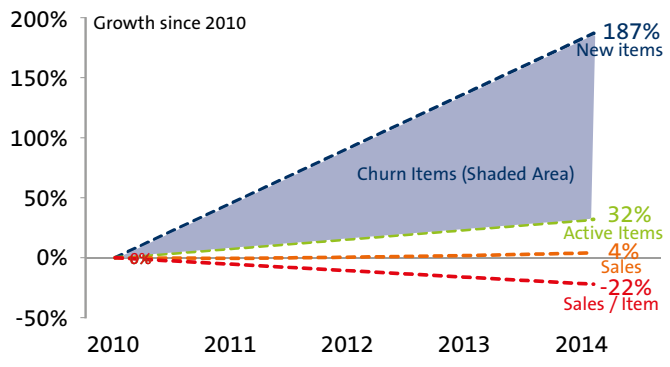
Miebach has found collaborative opportunities to reduce costs across the entire supply chain. From simple shared transportation initiatives to more sophisticated projects that require a completely new logistics model where potential savings can be as high as 39% of the combined total logistics costs of the collaborating partners **(Image 01)**.

01 **Potential total logistics cost savings in shared supply chains**



Source: Miebach Consulting 2015

02 SKU growth in a multiindustry environment



Source: Terra Technology. "2015 Forecasting Benchmark Study".

In summary, the rewards can be high enough to encourage businesses to invest the time and effort required to overcome the barriers, especially when they have exhausted all of the opportunities to improve internal efficiencies but remain under cost and service pressure.

Collaboration in the future

Whilst the current business environment can explain the recent increase in the number of collaborative initiatives, the pace of change and cost challenges will continue to drive companies to work together. There are five fundamental reasons which explain why collaboration will continue to evolve and grow:

1 Environmental sustainability

The climate change conference organized by the United Nations in Paris in December 2015 was a turning point in public opinion. The drive to reduce the carbon footprint will relentlessly put greater pressure on the users of conventional energy resources. Not surprisingly there is already substantial evidence that companies with good sustainability programs are rewarded with higher valuation of their stock prices in the capital markets. This pressure will increase the need for collaboration between companies to further improve the sustainability of their supply chains by reducing empty truck kilometers and the resulting emissions.

2 Big Data exploitation

The ability to analyze vast amounts of data generated by current technologies enables business to develop capability to better predict their supply chain challenges. The opportunities are many, but most probably one of the biggest will come from data sharing and analysis. For example: the analysis of shared POS data for different brands of the same product category, will better predict sales patterns and trends. Collaboration will enable the exploitation of the benefits that this new capability will offer.

3 Technology developments

Technology is developing at an exponential rate. Digital enhancements will continue to reduce the costs of communication and coordination of activities, and make it easier for companies to find external solutions. In parallel, it is going to be more difficult and cost prohibitive for individual businesses to continually upgrade to the latest technologies from the Internet of Things, sophisticated artificial intelligence algorithms, through to the robotics revolution. This will foster the development of supply chain models with a level of collaboration and even a much more sophisticated "co-creation" of solutions than the one that exist today, these new models will be more effective in dealing with the development of these new technologies.

4 SKU Proliferation

The exponential growth of e-commerce and the increasingly transparent pricing of products drive the need for business to find ways to differentiate themselves from their competitors. Product and service differentiation, which is also valued by consumers as part of a trend towards personalization, drives SKU proliferation. **(Image 02)**. Product differentiation is best done close to the consumer, at a late stage of the logistics operation. To make these operations cost efficient, companies will need to collaborate to design cost efficient scalable processes and develop shared facilities or 3PLs resources.

5 The rise of the collaborative economy

Another unstoppable trend is the development of business models where different actors share resources. In our economies there are lots of underutilized resources which, as an example, has enabled the development of business models based on sharing products and services e.g. shared cars (Getaround), car trips (Sharing Trip) or storage (Share My Storage). It is forecasts that by 2025, the collaborative rental economy will be the same size as the traditional rental model. The implications of the Shared Economy and its effect on the current logistics operations should not be underestimated. For example Carmaker Daimler, with Miebach's support, has developed the Car2share Cargo project in which, through smartphones, tablets and on-board applications, they are conducting pilot tests of a type "Uber" service with Mercedes Benz vans for customer home deliveries.

Supply chain collaboration is the future Businesses that do not grasp and exploit collaborative benefits will be at a distinct disadvantage to their competition, particularly when their customers and consumers are already collaborating.

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Processing: *VFV Grafik*

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SSI Schaefer realizes fashion logistics perfection

A new distribution center by SSI Schaefer forms the logistical basis for the omni-channeling of the Finnish Stockmann Group, one of the leading retail companies in Scandinavia and the Baltics. A combination of hanging and flat goods and a design concept according to the patented 3D-Matrix Solution facilitates the order processing of both over-the-counter and online trade from one single logistics facility.

In the middle of October, the Finnish department store chain Stockmann held its thirtieth "Hullut Päivät" event. Traditionally, these days attract bargain hunters from far and wide. In just five days, 1.4 million items were sold at the Group's stores, above all at the flagship store in Helsinki. With more than 50,000 m² of retail space over eight floors, it is the largest department store in Finland and one of the largest in Europe. Over one million customers also visited the online shop during these days, with shoppers unpacking their internet orders the very next day.

To overcome seasonal peaks like these and to build a firm foundation for further growth and the expansion of the firm's operations, Stockmann has in recent years completely overhauled their corporate logistics and geared towards omni-channeling. At the heart of this strategy is the distribution warehouse in Tuusula near

Helsinki, which was completed in May 2016. In October this warehouse handled the internet orders for the traditional bargain hunt for the very first time. It is based on a system concept with the latest, future-proof automation components, a picking strategy according to the goods to person principle and a high-performance warehouse management system that coordinates the completion of orders for the different distribution channels. After the tender procedure, SSI Schaefer received the contract for this new construction project as the general contractor for intralogistics. "An intelligent material flow concept, innovative system technology and attractive after-sales services for reliably supplying all distribution channels from a single installation," are how Stockmann Logistics Manager Elina Laine explains the decision to opt for SSI Schaefer.

Maximum availability

Stockmann is an intercontinental company and currently runs 16 subsidiaries and 700 stores in 16 countries, from Russia to Bosnia-Herzegovina to Dubai. The company was also an early adopter of e-commerce, beginning online trading at the turn of the century. "Both the sales figures and the online orders in October show the hugely significant role that this form of retail now plays," says Laine. "This forced us to restructure our logistics organization and shaped the design of our new logistics center."

Upon start-up of the new logistics center, the capacities of the four former warehouse locations were concentrated in Tuusula. Since May 2016, the supply of articles to the Stockmann department stores as well as the processing and shipping of online orders has

01 A hanging goods conveyor allows an automatic transport of garments between the levels of the hanging goods warehouse

02 In the shuttle system, 72 multi-level shuttles, type Navette, store and retrieve up to four bins simultaneously

03 27 repacking stations and nine pick to tote work stations are positioned in the pre-zone of the shuttle system

taken place in the new distribution center. It houses about 100,000 different articles; over 1.8 million individual items in total. "All types of articles – from large products to cosmetics and decorative items to hanging textile goods – are now bundled together in one location for every distribution channel," explains Elina Laine. "The distribution center is the central component of our omni-channel strategy."

The supply of over-the-counter and e-commerce retail customers with flat and hanging goods **(Image 01)**, as well as large and small accessories, from one single logistics facility presents a challenge for an efficient flow of materials and information. SSI Schaefer developed a solution that organizes the complex order handling processes into clear structures. By considering how to make the most efficient use of the 29,000 m² of warehouse space available, the automation components and IT installed guarantee the necessary performance. Furthermore, a five-strong team of technicians ensure for the continual maintenance and constant availability of the installation.

The centerpiece of the concept is a shuttle system with 130,500 bin storage locations for double-deep storage. The warehouse was designed according to SSI Schaefer's 3D-Matrix Solution. Forty-five shuttle lifts and 72 multi-level Navette shuttles **(Image 02)** guarantee the maximum availability and efficiency of the processes. "We were already looking for a shuttle solution when we issued the call for tenders," adds Logistics Manager Laine. "The modular and scalable solution concept from SSI Schaefer impressed us immediately, as it provides our business with that all-important flexibility." Furthermore, a pallet rack warehouse with 7,800 storage locations to replenish picking locations and a three-level hanging goods warehouse for more than 350,000 garments characterize the installation's design.

Efficient space utilization concept

As a further structuring criterion, SSI Schaefer implemented an optimal space utilization concept in Tuusula. The whole warehouse complex is thus divided into two halls. One hall houses the shuttle system as well as the repacking and picking stations for flat goods. The pallet rack warehouse and the hanging goods warehouse are in the other hall. Between the two halls there is a sequencing buffer on a platform construction with two fully automated packing stations. The space utilization concept saw the work stations positioned in a way that the most compact conveying system units possible could be installed. This means 27 repacking and nine picking stations are located directly in front of the shuttle system **(Image 03)**. A second level was created on a platform above the goods-in and out area that covers roughly one quarter of the picking area. On this platform, 22 workstations **(Image 04)** were installed for the dispatch of e-commerce orders. In the second hall in front of the hanging goods warehouse are the consolidation areas for goods-out. "The material flows for store and e-commerce orders had been consistently separated due to the different shipment packaging and transport service providers," says Rami Syrjä, Sales Manager for SSI Schaefer in Finland. "Coordinating this, structuring it according to staging times and different priorities and maintaining this all in perfect balance across a single installation presents a considerable challenge for the design of the warehouse management system." Stockmann opted for SSI Schaefer's Wamas-logistics-software. This is responsible for stock management, process control for a coordinated order completion and also offers complete transparency via its visualization components.

Inbound delivery of the goods take place both in the hanging goods and flat goods areas. At the repacking stations in the hanging goods area employees unpack the items of clothing delivered in cartons and hang them individually on coat hangers. After passing quality control, the goods are fed into a tunnel finisher as necessary, where they are steamed to remove any creases before they are transported to the warehouse area for hanging goods. The goods that are delivered to the goods-in area for flat goods are transported

04 At the e-commerce workstations, hanging and flat goods are consolidated and packed into shipping cartons

by forklifts either to replenish the pallet racks or directly to the repacking stations where they are deposited on pallet lift tables. This facilitates an ergonomically optimized repacking of the articles into the storage bin for the shuttle system.

Optimal solution for omni-channel suppliers

A conveying section transports the storage bins from the repacking stations to the transfer locations in the shuttle system. "The design according to the 3D-Matrix Solution with storage, buffering and sequencing in a single system, offers Stockmann maximum warehousing flexibility and efficiency," explains Syrjä.

A key construction characteristic is the consistent, parallel coordination of product movements along the X, Y and Z axes in the warehouse. The bins transported from the repacking stations are handed over to one of the shuttle lifts in the shuttle system. These transport the bins to one of the Navette's eight travel levels and place them on transfer stations. There, the multi-level shuttle with load handling devices take up to four bins as necessary and transport them to the allocated storage locations. Per story, the Navettes serve up to six storage levels on top of each other. A further special feature is that in one load cycle, a Navette moves a total of four loading units simultaneously, serving storage locations on two storage levels in a single operating sequence. This allows storage and retrieval to occur simultaneously, resulting in minimized travel times and a doubling of process efficiency.

Retrieval takes place in the reverse sequence. The bins are taken to one of the nine Pick to Tote work stations by the conveying system, where they are picked according to the goods to person principle. After picking, the bins that are to be delivered to stores return to the Navette and are consolidated there until the order is processed. For shipping e-commerce orders, the bins are transported directly to the packing locations in the e-commerce area, where they are repacked into shipping cartons. Parallel to this, a conveying section for hanging goods transports any order items from the hanging goods warehouse directly to the relevant packing location on the platform. Finally, the sealed and labeled shipping packages are taken to ground level by a conveying system, where they are sorted according to freight carrier and routed to the relevant shipping lane. Once the order is processed, the shipping bins that are to be delivered to department stores are retrieved from the shuttle system by the sequencing buffer. Finally, the shipping documents are printed and attached at the integrated printing stations and they are diverted to buffer lanes. On each of two levels, one on top of the other, nine lanes are available as a buffer for ten (dolly capacity) or 20 (pallet capacity) bins. When all the order bins are merged, the load carriers are transported under the platform by a conveying section and sent to an automated dolly stacker or palletizing robot. Finally, forklifts take the loaded pallets and dollies to the goods-out area, where they are consolidated with the order items of the manually picked hanging goods and prepared for loading.

The system as a whole is currently designed to have a performance of 55,000 order lines with 180,000 articles per day. The innovative concept has already proven itself: "In the new distribution center we are now able to complete orders for department stores and online orders much more quickly and transparently than before," summarizes Stockmann Logistics Manager Laine.

Photographs: *SSI Schaefer*

www.ssi-schaefer.com

About SSI Schaefer Group

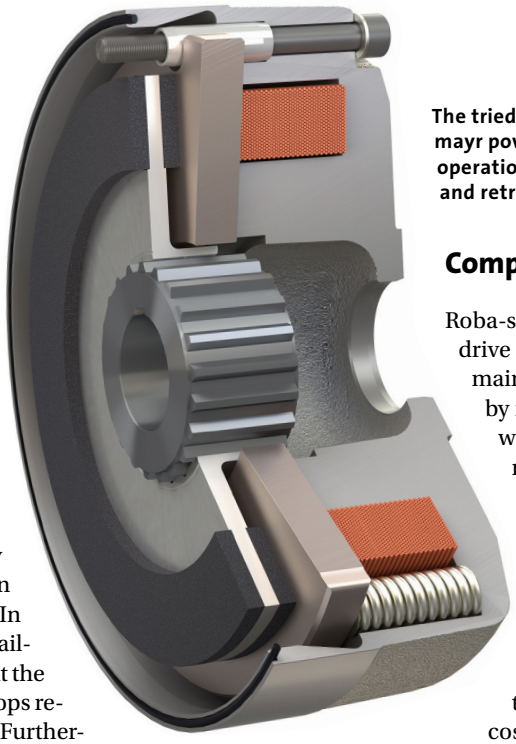
The SSI Schaefer Group is the world's leading provider of modular warehousing and logistics solutions. It employs over 8,500 people at its group headquarters in Neunkirchen, Germany, at its domestic and international production sites, and at its 60 foreign subsidiaries. Across six continents, SSI Schaefer develops and implements innovative industry-specific answers to its customers' unique challenges. As a result, it plays a key role in shaping the future of intralogistics.

Reliable safety brakes for storage and retrieval systems

Modern storage and retrieval systems ensure the smooth and efficient transportation of goods in automated high-rack warehouses. Here, the tried and tested Roba-stop-M-safety brakes by mayr power transmission are essential components, guaranteeing maximum operational and functional safety in such storage and retrieval systems.

WAREHOUSING

Fast availability worldwide and short lead times, increased order frequencies with simultaneously-falling order volumes – as globalization increases, so do the demands on intralogistics systems. Therefore, highly-dynamic storage and retrieval systems are used today in modern high-bay warehouses which move with maximum accuracy and permit optimum spatial utilization. In order to guarantee the safety of people, machines and materials at all times under heavy loads, innovative safety technology is essential. Therefore, a renowned manufacturer has relied on the tried and tested Roba-stop-M-safety brakes by mayr power transmission in their new storage and retrieval systems. In case of error conditions such as power failure and emergency stop, these ensure that the respective storage and retrieval system stops reliably within the shortest possible time. Furthermore, the safety brakes convince customers with their minimal energy requirements, extremely low self-heating and short switching times. The high service lifetime, the low levels of maintenance required and the simple and quick installation also make these brakes a particularly economical solution.



The tried and tested Roba-stop safety brakes by mayr power transmission guarantee maximum operational and functional reliability in storage and retrieval systems

Dynamic and energy-efficient

The storage and retrieval system distinguishes itself through a particularly dynamic drive concept. A frequency-controlled central drive interlocks through positive locking onto the upper and lower guide rails, each with a toothed wheel in a toothed rack. The synchronization takes place mechanically via a cardan shaft. As a result, the mast is doubly supported and therefore achieves high rigidity without load oscillations. Furthermore, the synchronous drive provides the prerequisites for a more lightweight mechanical construction. As a result, a smaller drive with lower electrical consumption is sufficient. Therefore, the storage and retrieval system operates extremely efficiently despite the high dynamics.

Safety through fail-safe principle

One Roba-stop-M safety brake by mayr power transmission is installed directly on each upper and lower toothed rack of the storage and retrieval system. These electromagnetic safety brakes work according to the fail-safe principle.

They are closed in a de-energized condition, and therefore also in case of a power failure or an emergency stop. When the current is switched on, the brake generates a magnetic field. As a result, the armature disk is pulled towards the coil carrier against the spring pressure. The rotor, which is connected to the bearing-mounted pinion shaft via a gear hub, is thus free, meaning that the brake is released. The shaft can rotate freely, and the pinion rotates in the toothed rack. In case of error conditions such as power failure or emergency stop, the Roba-stop-M brakes engage directly in the toothed rack as stand-alone brake systems independent of the drive, and reliably bring the machine to a standstill within the shortest possible time. The braking torque is retained even in case of damage to the brake, caused for example by cable breakage or failure of the magnetic coil.

Compact and functionally safe

Roba-stop-M brakes guarantee full safety even if the drive is dismantled, for example for installation or maintenance work. In addition, the safety brakes by mayr power transmission score crucial points with regard to operational safety and ease of maintenance in comparison to many other safety brakes. They distinguish themselves through an enclosed constructional design and the high Protection IP 54 or IP 65 in sealed design. Designed for a duty cycle of 100 per cent, the Roba-stop-M brakes are maintenance-free for the service lifetime of the friction linings. Their compact and functionally safe construction enables quick and cost-effective installation. Installation and adjustment errors can be avoided thanks to the design-specific, tested and non-changeable working air gap. Furthermore, the variable spring configuration for different torques makes the safety brakes particularly flexible.

mayr brakes reliably guarantee maximum operating safety. For this purpose, the company focuses on careful quality inspections: these include quality assurance measures during the course of the design process and a comprehensive final inspection. Prior to delivery, all brakes are intensively tested on test benches and function-relevant values are recorded. An electronic database in which the measurement values are archived together with the associated serial numbers of a product guarantee 100 percent traceability. Careful tests and inspection are central components of the mayr understanding of safety: they ensure that the values stated in the catalogue can also be reliably achieved.

Photographs: *Shutterstock, mayr power transmission*

www.mayr.com

About mayr power transmission

mayr power transmission is one of the most traditional and yet one of the most innovative German companies in the field of power transmission. Mayr specializes in torque limiters, shaft couplings and safety brakes as well as electromagnetic clutches and brakes. The company employs approximately 1,000 employees worldwide and continues to grow. Headquartered in Mauerstetten, Germany the company has production sites in China and Poland. 8 subsidiaries in Germany and 7 international offices including in China, France, Italy, Great Britan, Singapore, USA and Switzerland. After several extensions to the production and administration areas in the preceding years, the company now has a 17,700 m² production facility in Mauerstetten, Germany.

Smart solution for Brazil's largest sorting hub

E-commerce growth and ever shortening delivery times increase pressure on Parcel and Postal companies around the world. High-capacity automated sorting systems are the solution for this challenge. In Brazil's largest sorting hub, Vanderlande and Vitronic provided a turnkey solution to enable further growth and end-to-end visibility of shipment data.

Competition in the Parcel and Postal market is based on speed and accuracy. The customers demand even faster deliveries and full visibility of their orders, driven by new e-commerce shopping habits. Brazil, South America's largest economy, has seen a steady growth in population and consumer purchasing power. Today, there are more than 204 million inhabitants, who are increasingly using mobile devices and online payment platforms.

Braspress, the market leader, consolidated its Headquarters and operations in just one new site, named "Blue Planet" in Guarulhos, near Sao Paulo. The plot occupies 230,000 sq. meters, of which 90,000 sq. meters have been developed in the first phase. This strategic location is meant to be the corner stone for the long term expansion plans of the company.

A fully automated sorting system is the backbone of this strategic hub. The equipment is a SCS 1200, a cross-belt sorter with 102 external chutes, 1,081 carriers, an impressive length of 760 meters and a total footprint of 30,000 sq. meters.

The design capacity is 15,000 parcels/hour for an investment of around 15 Mil €, and a project duration of just 18 months. Vanderlande acted as the project manager and delivered the equipment, controls and software in budget and on time. The early involvement and the commitment of Braspress helped meet every milestone down to the final handover in September 2016.

Real time data transfer

One of the key components of this system is the Auto-ID solution. Such a high throughput installation, demands the best camera-based identification system to ensure reliable data capturing and an efficient workflow. Vanderlande commissioned Auto-ID specialist Vitronic to provide all the ID stations. LYL Ingeniería, the Spanish long-term partner of Vitronic ensured on-site support and smooth implementation.

About Vanderlande

Vanderlande, based in Veghel, the Netherlands, is the global market leader in airport luggage systems and sorting systems for package and post handling organizations. The company is also a front runner in the warehouse automation segment. Every day, Vanderlande's systems handle more than 8.8 million pieces of luggage and sort 300 packages per second. Components are normally manufactured in Veghel and then transported to project sites all across the globe.

About Vitronic

Vitronic is an owner-managed group based in Wiesbaden, Germany. Founded in 1984, the group is a world leader in industrial machine vision covering a wide spectrum from standard products with customer-specific modules to individually customized solutions in its core sectors of industry, logistics and traffic technology. Big brands in Parcel and Postal business and material handling systems rely on automated data capture solutions by Vitronic which can be integrated at any point along the process chain for the automatic capture of product data, package data and customer-specific data.

All incoming parcels are unloaded on 16 extendible conveyors and then weighted before they are directed to the sorter. In the next step, they move on to the Auto-ID systems, which are integrated into the conveyor technology. Each system is designed as a tunnel and includes five cameras. Additionally, the volume measurement system captures height, width and length of each parcel. To ensure highest throughput rates and process accuracy, four video coding stations will be implemented to process up to 2,000 shipments per day. All these data are transferred to Braspress in real time for operational and statistical purposes. When the parcels are in the destination chute, trucks and vans are loaded through extendibles for faster transit times and reduced handling errors.

Thanks to the smart solution provided by Vanderlande, not only does Braspress benefit from the highest throughput rates and transparency during the sorting process, they have also established the basis for future corporate developments. Luiz Carlos Lopes, Operations Director, said: "Braspress could not have chosen a better partner for this project, which will help us achieve our ambitious goals in the future."

Photographs: *Vanderlande*

www.vitronic.com
www.vanderlande.com

Calucem relies on complete packaging line by Beumer

Calucem d.o.o., a member of Calucem Group and based in Pula, Croatia, is a manufacturer of calcium aluminate cements that are predominantly used in the refractory industry. The company is now replacing its previous packaging line with filling, palletizing and packaging systems of Beumer Group. A pneumatic filling system is used, which allows a quick change of material without any loss.

Pula is located at the southernmost tip of Croatia. The town with its 57,000 inhabitants is known for its historic buildings dating back to antiquity. Many of its inhabitants make their living from producing wine, fishing and shipbuilding. But there is something else produced in this city steeped in history, calcium aluminate cement. Calucem d.o.o. is one of the leading suppliers of this building material that is sometimes also referred to as high-alumina cement. "It is resistant to high temperatures, chemical substances and corrosion", explains Alfred Blažina, managing director of the cement plant. "Due to these properties, it is used in the refractory industry, foundries, kilns and combustion chambers as well as in the building industry." This hydraulic binder is also particularly important for refractory concrete. It influences the rheology, the setting characteristic, the sifting properties and the chemical resistance. "We export our cement to more than 60 countries and are the world's number 2 supplier in this market", emphasises Blažina.

A tailor-made solution was required

Calcium aluminates are produced when limestone or bauxite is burned in furnaces at temperatures above 1,500 degrees Celsius. "The chemical composition changes depending on the application", explains Blažina. There is a growing demand for more resistant high-performance products. HiPerCem is a new addition to the product portfolio, used for the formulation of highly sophisticated refractory concrete. "The concept is based on a high calcium content, combined with an optimized grain size distribution", explains the managing director. Additionally, there are products for conventional ramming mixes and casting compounds.

After manufacturing, these different mixtures are ground, filled into bags, then palletized, packaged in film and transported to customers and retailers. "Up until now, we had used systems that were energy intensive and high in maintenance", says Blažina. Calucem employees were responsible for changing the filling system from one cement mixture to another, which was never a trouble-free process. Depending on its composition, the material can be more fine

or coarse. After a mixture change, large amounts of dust were generated, meaning material was lost. In search of a new solution and a suitable business partner, Calucem quickly found the intralogistics expert Beumer/Germany. "Our product has very specific properties", so Blažina. "We needed a supplier who we could develop a solution with for our particular product."

Air instead of turbine filling machines

As a single-source provider for filling, palletizing and packaging technologies, Beumer Group supports its customers with sustainable solutions from a single source. "We installed the entire line", says David Žargi, Beumer representative for the Western Balkans and supervisor for the Pula cement plant. The specialists integrated the machines and systems using intelligent automation and linked them efficiently. "The cement industry normally uses turbine filling machines", explains Stefan Bonenkamp, commissioning engineer at Beumer. "They are particularly suited for free flowing products, such as cement." But in order to guarantee loss-free filling of varying compositions, Beumer technicians installed a fillpac filling machine with two spouts that operates according to the air filling principle.

Air filling machines are especially used in the food industry. They use a blower to fluidize the material that is to be filled, e.g. flour or cacao powder. These products can then be filled into bags, gently and precisely, "without mechanical stress and at minimal air consumption", explains Bonenkamp. The product is filled according to the gross weight principle, i.e. the bags are weighed during the filling process. The fillpac is therefore equipped with calibration-capable weighing equipment. This electronic weighing ensures exact filling degrees for the fillpac. Special software supports permanent communication between the balance and the filling spout.

The product is then transferred through a rotary flap into the filling boiler. The ventilation of the boiler floor and of the upper part of the boiler can be regulated separately, which guarantees a continual product discharge. It creates a steady product flow with minimal compressed-air consumption. A special filling nozzle is equipped with a vent duct and an ejector that operates in cycles, extracting air from the bag during filling. After each filling process, the filling nozzle is cleaned by air pressure. This prevents the filled bag from being soiled. The quantity of the conveying air can be adjusted separately, depending on the product.

Precise and reliable palletizing solution

Calucem needed a compact and energy-saving solution for the fully automatic, efficient and above all, fast palletizing of the bags. As a single-source supplier, Beumer provided the fully automatic robotpac, solving complex palletizing and de-palletizing challenges reliably and efficiently. An ultrasound system ensures the precise measurement of the bags before they are palletized. This way, the position of the item can be exactly calculated and the bags can be placed precisely and gently. The precision guarantees an optimal stack configuration. This is not only representative of brand quality to the end customer; it also ensures that the stack remains stable during shipping and storage. The robotpac palletizes up to 600 bags per hour. Two gripping tools are used: a suction gripper, that places a paper sheet on the pallet, and a fork gripper, that palletizes the bags in the exact position on the carrier. "The flexibility of the robotic palletizer allows the customer to implement even complex processes with varying frame parameters", explains Žargi.

Compact, fast and practical packaging

Roller conveyors transport the palletized bags to the packaging system. "In order to keep the entire line compact and energy-efficient, we use the Beumer stretch hood A at this point in the line", says Žargi. "The high capacity packaging system from the stretch hood series was given a complete redesign." In order to facilitate the work for the maintenance personnel and to ensure high system availability, the new packaging system no longer needs a platform. Maintenance work, such as changing the blades or the sealing bars, is now handled at floor level. Additional benefits include the compact design and the resulting low height and small footprint.

A new film transport system, that is particularly gentle on the material, introduces the previously formed film hood into the system. On its way to the crimping and stretching unit, the sealing seam on the film hood cools down so that it can be crimped without losing time. Energy-consuming cooling units and long cooling times become superfluous. Economical engines and a lower demand in compressed air optimize the energy balance. "The palletized goods are clearly visible through the smooth surface of the transparent, highly flexible film", describes Žargi.

Blažina: "We have implemented this project hand in hand with Beumer. The result is a packaging line that is customized to our specific requirements." The cement manufacturer was convinced of the excellent technical cooperation during the planning and development phase, as well as optimal adaptation of the systems.

And because Beumer provided everything from one single source, Calucem has only one contact for the entire system. This was also very important for Blažina. "If necessary, Beumer service personnel can visit the plant to check the system and perform any required adjustments."

Photograph: *Beumer Group*

www.beumergroup.com

About Beumer

The Beumer Group is an international leader in the manufacture of intralogistics systems for conveying, loading, palletizing, packaging, sortation, and distribution. With 4,000 employees worldwide, the enterprise has annual sales of about 750 million Euros. Beumer Group and its subsidiaries and sales agencies provide their customers with high-quality system solutions and an extensive customer support network around the globe and across a wide range of industries, including bulk materials and piece goods, food/non-food, construction, mail order, post, and airport baggage handling.

Possible applications and approaches for project planning of Automated Guided Vehicle systems

More and more companies want to automate their in-plant material flow by using Automated Guided Vehicle systems (AGV). Thanks to progress in communication, navigation and safety-engineering, AGVs can be used flexibly and are easy to integrate into existing systems. What applications is an AGV suitable for and what requires attention in project planning?

Author: *Alexander Zeilhofer, Director of Technical Sales for Automatic Industrial trucks, Jungheinrich Logistiksysteme GmbH*

Automation in intralogistics is continually advancing. Users want solutions that are flexible – meaning modular, scalable and interface-ready. It should also be possible to implement solutions in the shortest time possible. AGVs provide an economical automation solution for many transport assignments. Using them offers numerous advantages: reliability, process safety and a high level of efficiency. They can also be used in mixed operation with manual industrial trucks or people. AGVs can also be adapted or expanded without difficulty. As a result, both interest and investment in AGVs have risen sharply in recent years. More and more companies want to tap into the optimization potential of automating their material flow with AGVs. But what applications are right for AGVs? What preconditions should be met for AGV use, what can be transported and is a special IT infrastructure necessary?

Applications

Automation with AGVs is suitable for companies of any size and for nearly all industries. Because an AGV is easy to integrate into existing infrastructures, it can be used flexibly in existing factory environments or in new buildings. To determine their own needs, companies should analyze the process to be automated in detail.

The main application fields of AGVs are continuous transport tasks such as goods receipt or transport from production to warehouse in multi-shift or round the clock operation.

AGV providers are currently receiving most of their requests from the manufacturing sector, especially the automotive industry and also companies in the food and packaging industries. The focus here is on supply and disposal for assembly and production systems – especially if the processes are already automated so there is no possibility of gaps in the automation.

Needs analysis

Before detailed project planning begins, companies should already have recorded some initial operating conditions as part of their needs assessment. This includes:

- The environment (temperature, floors, etc.)
- Loading aids and the load
- Layout with sources and sinks
- Transport volumes/transport matrix
- Order control

As a general rule, standardized and uniform loading aids together with good load distribution and stability of the loads being transported provide favorable conditions for use of AGVs. The warehouse should also be well organized, the temperature range should be between 0 and 40 °C, and the floors should be in good condition (industrial floor).

The layout should also already include rough planning of travel routes and all pick-up and delivery stations (number and type) for needs assessment. Other peripheral objects such as fire doors, high-speed doors or elevators should also be included in the layout. The reason for this is that narrow places, one-way routes, doors and elevators affect the possible travel speeds and therefore capacity calculations as well. The width required for travel routes depends on the width of the vehicles, which in turn is determined by the size, shape and weight of the load. The travel routes required to operate manually controlled forklift trucks are generally adequate.

To be able to calculate the capacity of the AGV, the first step is to calculate the transport volumes. To do this, the number of transport tasks per hour between the previously recorded pick-up and transfer points is calculated or recorded manually and transferred to a transport matrix. Another aspect to consider is how the AGV will receive transport orders: via WMS or forklift control system, by ERP or PPS, via machine interface or simply manually with a button or a tablet application with system visualization. Thus no WMS or any other extensive IT infrastructure is necessary to use AGVs.

Project planning with capacity dimensioning

The technical challenge in project planning for an AGV is due to the many different conditions on site in the planned application. Interested companies should therefore document their needs in a specification sheet or requirements specification. Based on this documentation, vehicles and load handling units can then be configured for the individual transport tasks, making it possible to work with individual loads, transfer heights, support heights and existing conveyor technology. Error-free communication between vehicles and an existing IT and software landscape or production machines can also be implemented for a specific project in this manner. The required transport capacity is used to calculate the number of vehicles required. The following factors determine how large the vehicle fleet must be to achieve sufficient availability for the average transport utilization, but also to cover peaks:

- Transport volume
- Ambient conditions: length of the transport routes and maximum travel speeds for calculating the number of transport tasks per hour and per route
- Charging stations: routes, ratio of charging time to transport time
- Order management: proportion of empty trips.

The result is the number of automated guided vehicles and charging stations required, which in turn is used to determine the size of the fleet. Vehicles with lithium-ion batteries and automatic contacting are capable of using transport breaks for recharging. This makes it possible to use AGVs round the clock without any operator interaction. In two-shift operation, lead batteries are still the solution that offers the best return on investment, provided the vehicle is equipped with energy-efficient drives and the AGV manufacturer guarantees two-shift operation without recharging.

The warehousing layout also affects the type of navigation to choose for the AGV. The possibilities include contour navigation, magnetic point navigation and reflector navigation, which is currently used most often. Contour navigation, which uses only the surroundings as orientation for the vehicle, does not require reflectors on walls, columns and racks as typically used for laser navigation.

Short amortization times in multi-shift operation

Automated guided vehicles offer many advantages: reliability, process safety and efficiency. The planned usage is an important deciding factor. Especially in two and three-shift operation, it may be worthwhile for companies to think in the direction of automation, since amortization of the investment is very attractive in these cases. However, practical applications may also be found in one-shift operation, for example if the AGV enables a clear separation between logistics and production, thereby improving production quality. Nevertheless, the only way to reliably prevent problems with processes later on is by creating professional functional specifications. Jungheinrich is happy to assist in planning, conception and implementation as a competent partner and complete solution provider for AGVs.

Photograph: *Jungheinrich*

www.jungheinrich.com

About Jungheinrich

Jungheinrich ranks among the world's leading companies in the material handling equipment, warehousing and material flow engineering sectors. The company is an intralogistics service and solution provider with manufacturing operations, which offers its customers a comprehensive range of forklift trucks, logistics systems, services and advice. Jungheinrich shares are traded on all German stock exchanges.

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