



WHITE PAPER

PACKAGING / CORRUGATED CARDBOARD

How to make your corrugated cardboard production more flexible and cost-effective

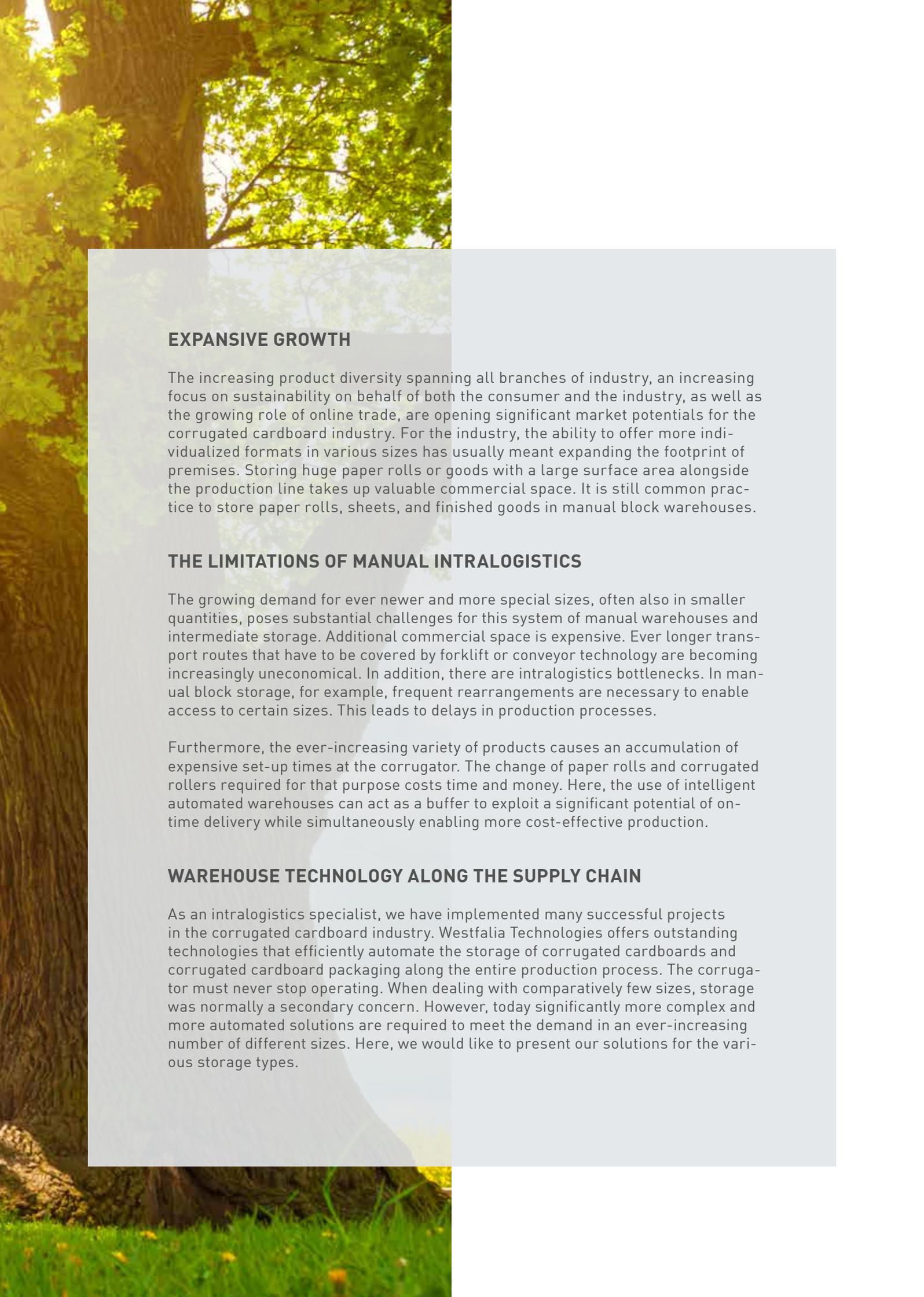


CORRUGATED CARDBOARD – THE “WAVE OF SUCCESS”

Automated high-density storage solutions and intralogistics automation along the value chain help manufacturers of corrugated cardboard and corrugated cardboard packaging to optimise their manufacturing to meet rising demand. Stephan Bruns, Sales Director at Westfalia Technologies, explains the technologies the intralogistics expert uses to increase his customers’ market flexibility.

The „wave of success“ runs between two thin layers of paper. The special stability of corrugated cardboard makes it a universal packaging material. Corrugated cardboard of various qualities can be shaped into many sizes and preformed parts which are ideally suited for the transport and protection of products.

It can protect products such as expensive electronic items or everyday goods like food. According to the German Packaging Institute, only 10 percent of the ecological impact in supermarkets is caused by the packaging, but 90 percent by the goods themselves. Without packaging, products spoil more quickly and are more often thrown away. In addition, packaging helps to label and market goods. Depending on the quality and fresh fibre content, corrugated cardboard is suited for high-quality printing. It reduces pollution caused by plastic and replaces a variety of filler materials. Corrugated cardboard mainly consists of recovered paper sourced from fallen and thinned timber combined with starch glue. Therefore, it is usually almost completely recyclable.



EXPANSIVE GROWTH

The increasing product diversity spanning all branches of industry, an increasing focus on sustainability on behalf of both the consumer and the industry, as well as the growing role of online trade, are opening significant market potentials for the corrugated cardboard industry. For the industry, the ability to offer more individualized formats in various sizes has usually meant expanding the footprint of premises. Storing huge paper rolls or goods with a large surface area alongside the production line takes up valuable commercial space. It is still common practice to store paper rolls, sheets, and finished goods in manual block warehouses.

THE LIMITATIONS OF MANUAL INTRALOGISTICS

The growing demand for ever newer and more special sizes, often also in smaller quantities, poses substantial challenges for this system of manual warehouses and intermediate storage. Additional commercial space is expensive. Ever longer transport routes that have to be covered by forklift or conveyor technology are becoming increasingly uneconomical. In addition, there are intralogistics bottlenecks. In manual block storage, for example, frequent rearrangements are necessary to enable access to certain sizes. This leads to delays in production processes.

Furthermore, the ever-increasing variety of products causes an accumulation of expensive set-up times at the corrugator. The change of paper rolls and corrugated rollers required for that purpose costs time and money. Here, the use of intelligent automated warehouses can act as a buffer to exploit a significant potential of on-time delivery while simultaneously enabling more cost-effective production.

WAREHOUSE TECHNOLOGY ALONG THE SUPPLY CHAIN

As an intralogistics specialist, we have implemented many successful projects in the corrugated cardboard industry. Westfalia Technologies offers outstanding technologies that efficiently automate the storage of corrugated cardboards and corrugated cardboard packaging along the entire production process. The corrugator must never stop operating. When dealing with comparatively few sizes, storage was normally a secondary concern. However, today significantly more complex and more automated solutions are required to meet the demand in an ever-increasing number of different sizes. Here, we would like to present our solutions for the various storage types.



THE PAPER ROLL WAREHOUSE



IS THIS YOUR CHALLENGE?

Forklifts with roll grippers place massive paper rolls on a free floor space. For a growing production, this means that this raw material warehouse must increase its size. The required aisles and routes for the forklifts occupy additional space and must be taken into consideration. The forklifts can generally grip and transport one roll at a time. This multiplies the necessary travel paths for storage, retrieval and provision to the corrugator.



THE AUTOMATED PAPER ROLL WAREHOUSE

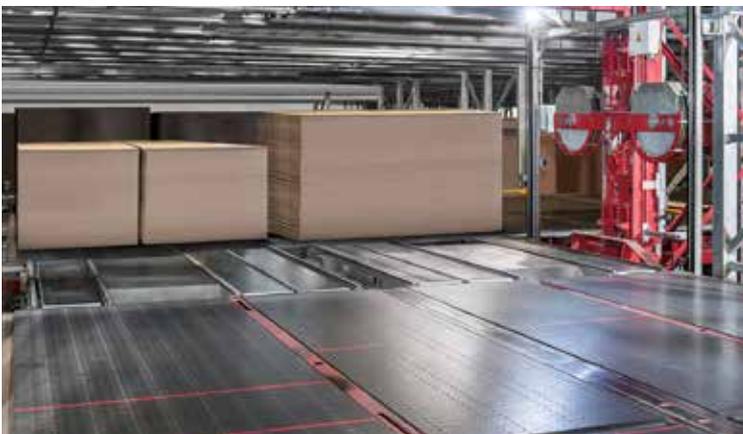
> Paper and corrugated cardboard have no expiration date. The exact point in time when rolls are stored and retrieved is not a critical factor. An automated high-density storage system therefore allows multi-deep storage of a single type of paper rolls. That means that on every level of the high-bay warehouse multiple rolls are stacked

in a row and accessed by one storage and retrieval machine.

- > Our patented load handling device Satellite® can handle the most varied sizes and loads. The rolls are stored in dedicated palletless storage profiles designed by us.
- > Less-used aisles and storage and retrieval machines for each storage space reduce construction and operating costs. When additional space is needed, the automated raw materials warehouse can be height-adjusted and therefore requires less surface area.
- > The vertical multi-deep layout saves space and yet still increases the capacity. As a manufacturer of corrugated cardboard and packaging, you are able to react more flexibly to the price of paper and build up higher stocks.
- > Our Savanna.NET® Warehouse Execution System operates the storage and retrieval machines and takes care of the warehouse management. It supplies the raw materials on a just-in-time basis.



THE INTERMEDIATE STORAGE FOR SHEETS



AUTOMATED INTERMEDIATE STORAGE FOR CORRUGATED CARDBOARD

- > The intermediate storage of half-finished goods for the production of corrugated cardboard or packaging is characterised by a high degree of variety. The many variants are already reflected in the finished products. Piles of cut-to-size corrugated cardboard sizes are therefore ideally stored without pallets either as a single

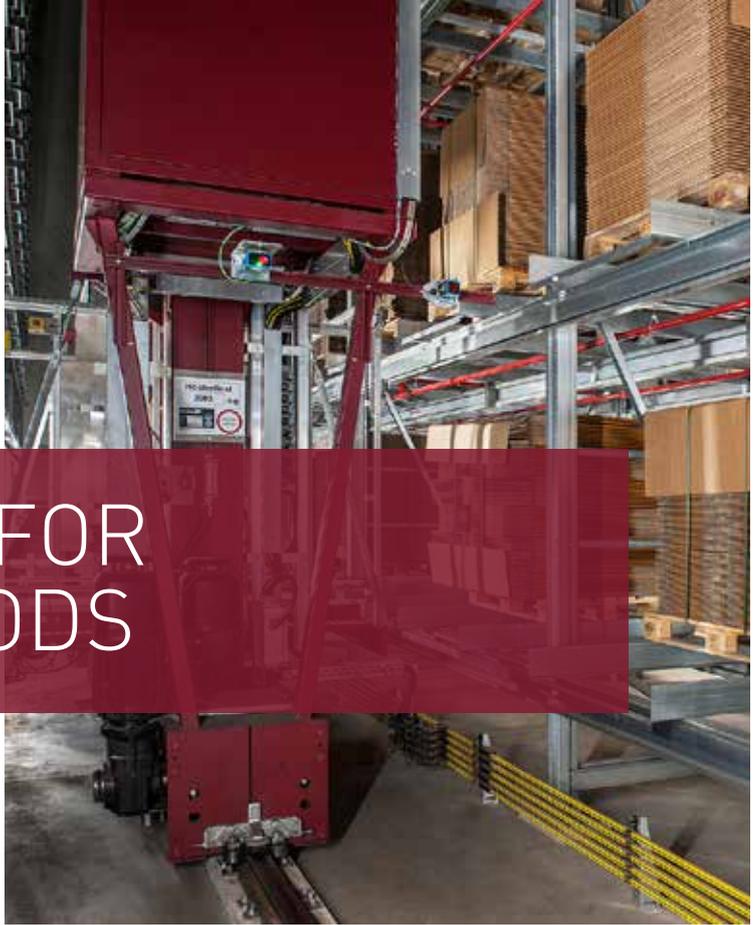
unit or multiple units deep so that storage and retrieval machine with telescopic forks or Satellite® system can grip them.

- > Automated storage and retrieval using the storage and retrieval machines minimises the susceptibility to errors as well as the accident risks associated with manual operation. The overall system consisting of the mechanics, control device, and software supplies all half-finished products as required within the production process. Storage space is never wasted. Instead, it is always refilled as needed.
- > Additional capacity requirements on a restricted area can be easily met using a high-bay warehouse. Our self-manufactured storage and retrieval machines can handle small, medium, and large sizes as well as varying loads. This is what we specialise in at Westfalia.
- > Intermediate storage makes the production more flexible. After conversion of the corrugator, a significantly larger batch of a certain product type can be manufactured for delayed orders. As a result, expensive set-up times are significantly reduced, and production planning is simplified. The automated and scalable intermediate storage makes this possible.



IS THIS YOUR CHALLENGE?

The production of corrugated cardboard in various thicknesses and qualities is a complex process. Cut-to-size sheets are temporarily stored in the manual block warehouse or buffer sections throughout the entire production process. That means storage capacity with a high area usage and long material routes.



WAREHOUSE FOR FINISHED GOODS



IS THIS YOUR CHALLENGE?

Storing finished goods and being able to provide them smoothly for an on-time delivery is the most important job. With the wide range of products available on the market, the demand for different corrugated cardboard sizes is also expanding. Capacity requirements as well as the complexity of finished goods storage are increasing. More and more frequently, manual storage facilities quickly reach their limits. Retaining the retrieval speed to provide on-time deliveries requires more warehouse personnel and forklifts. A higher level of traffic within the warehouse also increases the risk of accidents and the probability that bottlenecks and delays in retrieval will occur due to errors.



THE AUTOMATED FINISHED GOODS WAREHOUSE

> Our automated high-bay warehouses based on Satellite® and telescopic fork technology enable us to store great volumes in a particularly compact, sustainable, and energy-saving way – either in existing buildings or in self-supporting silo construction that does not require an additional storage building. The system

makes the most use of all types and sizes of properties and warehouses.

- > Depending on the required accessibility, automated high-bay warehouses made by Westfalia can be designed flexibly – everything from single-bay storage with quick access up to the multi-deep storage of large single-variety batches. Automated high-bay warehouses bundle the logistics in centralized locations and therefore create synergies within the supply chain, if desired including automated loading and unloading systems for trucks.
- > The system is flexible and can be adapted to every size. We can easily connect shipping zones with supply paths for a wide range of order sizes.

Conclusion

PERFECT WAREHOUSE LOGISTICS FROM A SINGLE SOURCE

We design and build independent storage systems that can be integrated into existing systems and are easy to expand. This way, the storage systems can be adapted to the market developments. None of our warehouses is off-the-shelf; we analyse the actual situation individually for each customer. We are committed to providing transparent quotations without any hidden costs. In addition, we strive to provide our customers with on-time delivery and turnkey storage systems with sustainable benefit.

We can replicate every storage requirement using our warehouse execution software. Thanks to our in-house manufacturing of storage and retrieval machines and PLC control systems as well as a strong network of suppliers, we offer on-time delivery of the most modern technologies for the entire scope of intralogistics. For the required IT infrastructure, we offer TERRA products supplied by WORTMANN AG corporate group of which we are a member. As a general contractor, we manage your project from initial consultation to acceptance and sustainable customer service.

We were the first manufacturer to develop the key technology for the multi-deep, high-density storage of large sizes and loads for different load carriers – the Satellite® storage system. Use these advantages to raise the capacity and flexibility of your corrugated cardboard production to a new level.

Would you like to learn more? I look forward to your inquiries and will be happy to advise you.

Stephan Bruns



STEPHAN BRUNS

The graduate mechanical engineer has been with Westfalia since 2017 and has been in the intralogistics industry for more than 30 years. As Sales Director Technologies & Systems, he is responsible for new installations in the field of supply chain automation.

OUR VALUES

ALL FROM A SINGLE SOURCE

Logistics planning, mechanical engineering, control systems, software development, installation, and project funding

QUALITY MADE IN GERMANY

All manufactured centrally at the corporate headquarters in Borgholzhausen with our own test center for key units

EXPERTISE & FLEXIBILITY

Consulting, conceptualization, customer solutions made to measure

HONESTY & FAIRNESS

Transparent pricing, fair price-performance ratio

CUSTOMER PROXIMITY & AUTHENTICITY

Flat hierarchies; experts available at every project stage

SPEED & COMMITMENT

Local service centers; customers always supported by the same personal contacts

SECURITY & RELIABILITY

Dedicated and experienced employees ensure investment security and product functionality

RESPONSIBILITY

Job security in Germany, environmental awareness, and social commitment

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