Production logistics tools to improve productivity in the FMCG industry

The FMCG (Fast Moving Consumer Goods) industry is extremely competitive. Consumers have high demands on price and quality, and are increasingly disloyal to brands, quickly choosing a different brand or product if the other offer appears better.

"We have been able to create a conveyor platform with twice the speed capacity and half the noise level compared to todays solutions." says Anders Jonsson, project leader, X85 conveyor platform.

Challenges

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The recent rise of private-label goods has led to increased competition within the FMCG industry. A focus on bringing high volume products at lower prices to the market has created greater demands on all actors. Producers must differentiate their products and quickly bring them to market.

This has spurred the rise of many more product variants and a frequent replacement of products, in order to achieve the best positioning in the current market.

Manufacturers must adapt and be able to produce products in smaller batch sizes to win the battle on the shelf. It is necessary to have the freshest product.

Additionally, demand for FMCG can be very seasonal, meaning manufacturers must be very flexible to produce different goods. It also means that fast time to market with an innovation is crucial to win customers. A very fast setup and installation of a production line is necessary to achieve this.

Since products are consumed shortly after they are produced, it is imperative to keep production uptime at its high at all times. Any stop in production can cause empty shelves and lost market share.

So line uptime must be on a high level and MTBF (Mean Time Before Failure) must be as long as possible. Who buys a damaged or dented product? Consumers have the right to expect good quality and easily reject a damaged or dented product. Products and packaging are not allowed to be damaged during the manufacturing process.

In the FMCG industry, improved production logistics solutions are major drivers of productivity development. With the new developed X85 conveyor platform, FlexLink has aimed for factor two in all aspects of the conveyor system performance.

– So what does it mean?

High capacity – high speed

In packaging and filling lines, the balancing of capacities created through increased line speed capacity. Current conveyor platforms normally work within a range of 40 to 60 m/min, corresponding to a capacity of 24 000 milk packages per hour, and sometimes up to 80 m/min with special solutions.

New packaging solutions and machine generations' open up for higher capacity levels. What was high speed yesterday is a common and ordinary speed today. Looking into the tissue converting industry that is leading this development,

capacity demands are today at 10 products per second, corresponding to 36 000 products per hour and a conveyor speed up to 120 m/min. Filling and packaging machinery speed is increasing day by day and FlexLink's new X85 conveyor system offers an upper speed limit of 120 m/min.

The chain design builds on a 25 year experience and state of the art materials on wear parts such as chain and slide rail. As high speed capability makes products more sensitive to dents and damages, FlexLink's distributed line control allows high speed with dynamic speed control, giving soft starts and stops that enable gentle product handling. It also contributes by minimizing sudden stoppages caused by products falling over, especially in combination with well adjusted guiding systems and transfers between conveyors and machinery.

Easy line balancing

Speed itself is not enough and the ability to control the speed, and thus the capacity, has a major impact on the line utilization. Through a dynamic control of the speed in the conveyor sections, it allows dynamic buffering in the conveying sections with a consistent impact on the line throughput.

Speed varies seamlessly up and down, balancing product flow between up- and downstream machines. This way, waiting time is minimized. The ability to control the speed dynamically offers soft starts and stops and easy line balancing, finding the appropriate speed in the respective line segment.

By using divert and merge functions, product flows can be directed to specific machines either for balancing capacity and/or to make product variants. In the highly competitive tissue industry, FlexLink supplies lines with dynamic matrix layouts, making it possible to produce any mix of all the variants the machines are capable of, at optimum line efficiency. Products can be individually combined at cycle time of as low as 0,1 second.

Small batches, high service level

Requirements on higher delivery service and lower inventory levels, requires smaller batch sizes, easier and more frequent re-settings of manufacturing lines. Distributing the different products in process between the processing and packaging machines, in the right sequence and time is necessary to achieve high line efficiency.

Furthermore, it requires that the logistic system – conveyor system – is easy and fast to reset in handling of all involved products and variants.

Guide supports for products must be easy to adjust for the different product sizes, and manually or automatically adjustable. FlexLink's AGS (Automatic Guiding System) is the most sophisticated system to handle those issues. It can communicate with the machines and automatically adjust the guide width to the new variant the machine must produce. This means resetting without manual interference and time loss, and in recent cases payback time is as short as 3-4 months.

New machinery and equipment must be easy to install with a minimum of line standstill. Conveyor systems and the line layout are often a consequence of history and series of modifications. Instead, the line layout should be a consequence of balancing the machine capacities with the required tact time (demand expressed as the max time between products manufactured in order to meet the demand), visibility and physical restrictions when it comes to machinery and facilities.

FlexLink's new X85 conveyor is a further step forward when it comes to flexibility of the ingoing components and functions. Attaching equipment is easier than ever with double T-slots which not only make it easy to attach equipment at any place, it is also sturdy for robust installations. A series of functions like in-line transfer makes it easy to attach new sections to an established line.

Preconfigured functions make the line re-build easy and efficient, standardized interfaces and proven functionality make the job effort-free and the ramp-up fast with a minimum of standstill.

Eliminating the risk of products falling in the transfer between conveyor sections – a standard in-line transfer module.

Gentle product handling

Quality demands on the FMCG industry are rigorous. Health regulations demand that manufactured goods are produced consistently with high reliability.

A high speed in production lines is a sensitive issue when it comes to handling damages, products are accelerated fast out of machines and arrive at machine inlets at high speed. By controlling the conveyor speed in a seamless manner, products can be handled nice and gentle, still at high line capacity. FlexLink's Distributed Line Control allows each conveyor section to have a controlled high speed capability with seamless speed changes, also allowing dynamic buffering on conveyor sections without having products crashing into each other. The appearance of surface contact between the machine and the product is another potential source of damages. Typical areas are the surface of he conveyor chain, the guide rail appearance and adjustment of guide rails and machine in- and outlets.

FlexLink's X85 has very tight tolerances when it comes to chain top surface and dimensions. For extra sensitive products, there are chain variants with even tighter tolerances and extra smooth chain top, and flocked chain tops for the highest requirements. Even prestige product packages covered with thin gold color are handled at high production speeds without scratching of the sensitive packages.

Transfers between conveyor sections and machines are another source of potential damages to the products as well as sudden line stoppages.

With the X85 conveyor platform, FlexLink launches new in-line transfers allowing seamless transfer between conveyor sections. As a result, the risk of products falling, creating sudden stoppages or dented products, is virtually eliminated. Correctly adjusted guiding systems is another contributor to product safety, and they must be easy to adjust. Either it is done with fixed measure inserts that are easily exchangeable, or with adjustable guide rail systems. FlexLink offers a variety of fixed and adjustable guide rail systems, from manually adjustable to the AGS (Automatic Guiding System) that can immediately adjusts the guide rail width to fit the product produced.

Extensive engineering and testing resulting in low noise level.

Working environment

When it comes to the working environment and handling equipment, the most apparent areas are operator safety and noise level. Many conveyor systems still expose operators to substantial risks of injuries, and too high noise levels.

Having built more conveyor systems than anyone, FlexLink has put much emphasis in developing installations that are safe, yet efficient. An example is the wheel bends that have a closed design without pinch points, but are still very flexible and provide easy and gentle transport through tight bends. Additionally, an overlapping chain with no horizontal openings is provided.

Noise from machines and equipment is one of the hottest issues in manufacturing environments today. A good working environment is not only necessary for attracting qualified labor, it is also a matter of the company image, a crucial element in the eyes of the consumers.

FlexLink has spent considerable efforts in reducing the noise level in conveyor systems and indeed, it is a complex system with a number of noise sources. Considerable work has been spent on reducing the impact of each noise source.

It concerns a number of elements from ensuring a good guidance of the moving chain link, the combination of materials, design of chain in- and outlets, system stiffness and the speed control of the system. There are a number of coinciding factors that creating the noise and the same goes for the remedying of the noise sources. With the new X85 conveyor, FlexLink is claiming a noise level of maximum 60 dB(A) at reference speed. At higher speeds, the difference is considerable. This of course only concerns the conveyor system, but it's an indication on what is to be expected. And for sure, requirements are not going to be less demanding in the future.

MTBF – it is all in the details

Unplanned and frequent stops in the production line, is killing efficiency and delivery service to customers. How can it be minimized when it comes to the conveyor system? Let us look at a number of areas where the new conveyor platform makes a difference.

The conveyor: With the new X85 conveyor platform, considerable research has been spent on developing a conveyor that offers significantly less wear and much increased MTBF (Mean Time Between Failures). The most obvious areas are the new strong chain design with optimized contact surfaces allowing a low contact force even in plain bends (a typical conveyor killer area). Another area is the new slide rail design that together with the new chain link, enables a long and trouble free service.

Drive units and idler ends: Apart from the refined design with the latest updates on materials, chain in- and outlets, motor and hypoid gear designs, it is available in different performance executions.

Idler ends in compact and heavy executions, the drive units in compact, medium and heavy executions: All ingoing components are up to the highest industry standards, not only is it easy to get the right unit matching the application needs, but most importantly to get a high performance and a trouble-free installation.

With the distributed line control, drive units have integrated frequency control, allowing soft starts and stops which has a considerable impact on the installation service life. Wear is drastically reduced on all ingoing parts and to put it in other words, the installation is run in a gentle, controlled manner offering substantially increased MTBF.

Optimized guiding of chain elements, sophisticated materials and reduced contact pressure enables considerably increased MTBF (Mean Time Between Failure) and unwanted production stops.

Value for money

Investments must be spent where it has the most impact on issues the consumers are prepared spending for. All aspects are not of the same importance even though quality requirements are high.

FlexLink is now introducing pre-configured conveyor recipes matching identified performance criteria. This means that for a straight forward conveyor between two machines, you do not have to think twice, there is an attractive offer with a performance level corresponding to the application needs.

It starts with a basic level for short conveyors, light loads and low to moderate speeds – a case most manufacturers recognize. The more the requirements on increase, on speed, load, flexibility and specific issues like antibacterial properties, and there is a matching recipe to most needs. If not, there is always the possibility to make special configurations, like the procedures for conventional configuration of equipment today.

Easy engineering, no worries

Sophisticated engineering tools enable an easy and fast engineering of conveyor systems. Surprised? The importance of a fast line ramp-up and getting the right configuration makes a difference when it comes to the economy motivating the investment. As demands are different, FlexLink offers a range of engineering tools to different design situations.

With X85, FlexLink introduces state of the art engineering tools for conveyor system design. Available on-line through ‘My FlexLink’, the unique configuration tool allows direct design of the conveyor according to your needs, easy and correct. Choose the layout of the conveyor you require and select the recipe corresponding to your application demands and it is ready. It is easy to do it right, it is fast and available around the clock.

For the engineer who wants to make distinguished conveyor system layouts, 3D CAD blocks are available for download through the web portal My FlexLink. The for-

mats support CAD applications like SolidWorks and Inventor as well as neutral formats such as STEP, SAT etc. AutoCAD and Mechanical Desktop users are also supported by FlexCAD NG, the latest, intelligent 3D engineering tool.

For quick indications and as a tool for discussing layouts, the Configura® tool offers a direct visualization of the layout and BOM – as easy as designing your own IKEA kitchen on the web! For qualified simulation of line layouts, simulation services offers easy and direct possibilities to verify the impact of different solutions. The simulation services library contains all standard components and functions of the X85 conveyor system and allows you, the engineer, to make a thorough analysis of different scenarios in dialogue with the buyer. Making the right choice should not be hard!

Lower power consumption – be green

A loss is any effort (activity or energy) not adding to the customer value, anything that the customer is not prepared to pay for. Green issues are also a matter of concern today, so power consumption must be minimized.

With FlexLink's distributed line control, the power consumption is 30-60% less than comparable drive systems for conveyors. Over time, it has a significant impact on the investment's life cycle cost. Interesting enough this effect is on top of other effects like increased line balancing and improved product handling.

Invest today – ROI is close

Why invest now when times are tough and we fight to deliver in time and for market share? The reason is simple –in this competitive landscape we must continue the technical development in order to meet the reality of tomorrow.

By optimizing the production flow, we can leverage on extensive investments in production machinery, but also in the investments in marketing and product development. Without the ability to deliver in time and at a competitive price and profitability, the competitiveness will wither away.

The conclusion is easy, improve competitiveness is an all day job without pauses. It can be small scale, like minimizing small but significant sources of losses, and it can be on the larger scale by introducing new, high efficiency production systems. The important ting is that the work is done on a continuous foundation based on competitiveness and customer satisfaction.

– Good luck!