

ARMOR

CONTROLLING SHOP FLOOR PRODUCTION



ARMOR is the world's leading manufacturer of thermal transfer ribbons, which are widely used to print variable information related to traceability. Common applications include parcel shipping labels, foodstuff use-by dates and garment label washing instructions.

Goal:

Implement a planning and scheduling solution that allows Armor's production team to control customer lead-times, reduce product waste and avoid shop floor stock-outs, while maximizing equipment uptime.

Solution:

DELMIA Production Planning & Scheduling solution

Benefits:

Reduced human intervention, faster planning, sustainably high customer service levels throughout periods of increased loads, efficiency gains, reduced product and process waste, and improved responsiveness.

ARMOR, THE WORLD LEADER IN THERMAL TRANSFER RIBBONS

Armor was founded in 1922 and today is the world leader in Thermal Transfer ribbons. The ARMOR Group has strong annual growth, 1,800 employees and revenues of €245 million (2016). The Group's head office is located in Nantes, France. It has production facilities located in Brazil, Mexico, USA, Canada, South Africa, Singapore, China and India, and a main manufacturing plant on the edge of Nantes.

OPTIMIZING MANUFACTURING PERFORMANCE AT ARMOR'S MAIN PLANT IN NANTES

DELMIA has helped the Group optimize operational performance and control production flows in the 600-person Nantes plant, a facility that produces more than 60,000 rolls per day, 7 days a week and 365 days a year. The project was a complex one because of the interdependence of the plant's three main manufacturing shops—ink grinding, spool coating and roll cutting—which needed to be synchronized to avoid overproduction while still meeting delivery lead-times.

INCREASED FLEXIBILITY FOR THE GRINDING SHOP WHEN PRODUCING RAW MATERIAL FOR THE COATING SHOP

In the coating shop, ink tanks are made available to the coating machines based on consumption; each coating batch can consume several tanks and a tank can serve several coating batches. Prior to implementing DELMIA, volumes were constantly growing (+7%/year), which meant planning for this workshop was difficult—equipment was often underutilized and that impacted the rest of the production chain.

There were other constraints: The coating shop encompasses a large number of machines, the grinding processes are disparate and complex, the actual ink consumption can vary +/- 10% from the theoretical consumption, and some inks have a maximum lifetime of 24 hours, so coordination with coating becomes vital.

DELMIA adds flexibility to the coating shop by making it possible to regularly validate the load/capacity matching; avoid stock-outs and overproductions; reduce waste; and reschedule production orders daily, based on variances and new needs.

The coating shop is synchronized with the grinding shop and the runs are coordinated between grinding and coating.

"We wanted a production planning and scheduling solution that could help us control customer lead-times, reduce product waste and avoid stock-outs on the shop floor, while maximizing equipment uptime. DELMIA was selected because it was the tool that best met the challenges and issues we wanted to resolve."

— Tony Conradt,
ARMOR Digital Manufacturing Systems Manager

The coating shop supplies all of the Group's Thermal Transfer manufacturing plants and drives the grinding needs. The shop's production runs typically last at least a week but the team needs to avoid changeovers over the weekend, so effective production planning and synchronization is critical.

By coordinating runs between grinding and coating, DELMIA makes it possible to avoid ink stock-outs and overproductions, and to optimize the management of color runs and the associated changeover times. It also makes it possible for the planning team to accurately predict an operators' resource requirements versus the forecast load.

THE CUTTING AND PACKAGING SHOPS:

Constraints and Challenges

The cutting shop was the first manufacturing shop to implement DELMIA. There are diverse constraints in this shop, including:

- The materials database is extensive, with more than 10,000 SKUs
- Most of the machinery is automated and constantly updated with variable range times, and changeover times that are longer on robotized cutters
- Product/machine compatibility is more or less flexible; therefore the need to take into account the availability of machines limited to specific products, whose demand varies over time
- Production quantities can vary from a few dozen rolls to several tens of thousands of rolls. For small quantities, the machine setup and changeover time can be as much as the production time
- Shipping lead-times are short; next-day on stock and D+3 on made-to-order

Coordinating the sequences of WOs (Working Orders) on each cutter to optimize machine utilization, while meeting customer delivery dates, is essential. Weekend scheduling is also complex because only automated equipment is used. The products' compatibility with the machinery (both in cutting and in packaging) must be controlled while also adapting the product mix, since the weekend packaging capacity is limited for certain types of products.

DELMIA makes it possible to manage the scheduling for cutting and packaging shops with an alert system and to control the load through regular simulations. Schedulers can now plan the weekend in a few minutes, a task that previously took several hours.

The Benefits Provided by the Solution

"Today we manage and plan all of our manufacturing shops in a semi-automated fashion using DELMIA," said Conrard. "The system lets us re-compute the schedule every day so we can dedicate the scheduling teams to real value-added tasks, while giving the schedulers flexibility in certain choices or certain situations, such as with test WOs or rush WOs which are injected into the daily schedule."

According to Conrard, the benefits are seen at several levels.

First, the planning requires less human involvement: "Today, manual scheduling readjustments account for just 15% of the calculated schedule whereas, originally, everything was done manually." The schedulers also save time for weekend planning: "Before, weekend planning required 2 to 3 hours, whereas now it only takes the schedulers 30 minutes."



High customer service levels are maintained, even during major load periods, with the same level of resources: "Without DELMIA, we would never have been able to absorb the current load and maintain our customer service level, while maintaining the same number of material and human resources."

Productivity gains have also been recorded: "By finely scheduling the production runs, we have increased productivity, both in terms of production time and changeover time. We are able to limit the risks of product outage for downstream steps in the process while avoiding overproduction, which reduces product and process waste."

Improved responsiveness: "We have continuous insight into our advance/backlog status and can respond accordingly on a daily basis. The utilization of our manufacturing assets is more efficient, and the value added of administrative tasks is maximized. DELMIA is an excellent addition to our ERP and MES. The combination of the three lets us push automations and eliminate paper documents and double entries, which makes it possible to maximize both the utilization of our manufacturing assets and the value added of administrative tasks."

A POSITIVE RESULT

For Tony Connradt, the impact has been significant: "Every day, DELMIA lets us control customer lead-time and even improve it, while helping us better manage machine utilization. We've seen a reduction in customer lead-time from ten to three business days and a 50% reduction in product stock-outs in the manufacturing shops."

Focus on Armor
Leader of Thermal Transfer ribbon printing technologies

Products: Thermal Transfer Ribbons

Personnel: 1,800

Headquarters: Nantes, France

For more information
www.armor-group.com

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