

Higher Turnover, Fewer Breakdowns, thanks to LeaderMES

# Bato Takes Next Step in Computerization

When managing director Gert-Jan Spierings took over the position of managing director of Bato Plastics in 2001, he said that employees did not need to fear for their jobs – but that turnover should increase.

Bato's initial investments were in items such as robots and automatic transportation of raw materials. The result: the turnover is 2.5 times over what it was 5 years ago - with the same number of employees. It should go up because this summer an MES-System was put into operation - LeaderMES – to further increase turnover. This system increases process efficiency, for example, because it leads to less machine breakdowns. This is good news for a company that continues to operate unmanned during the night. You are reading a report about the changes in the operation of Bato due to the arrival of LeaderMES.

First, Spierings explains the logic behind the purchase of an MES-System: 'In Western Europe, you are forced to produce more and more efficiently. At a given moment, robots, automatic material transportation and automatic packaging lines alone are not sufficient. Now that the 'solid' computerization is finished for the most part, we are seeking new efficiency improvements in less tangible factors. Think about issues such as planning, managing people and optimizing production itself.'

Thinking about a Manufacturing Execution System, or MES, is then not far behind. The immediate reason to invest in an MES-System was for Spierings the nightly unmanned production. 'If production stopped, we only found that out in the factory the next morning, while we didn't know how long a stopped machine had operated. With the new system, we're warned - even if we are at home - via alerts that something out of the ordinary is going on with the cycle times or if machines do not run. If necessary, we can go to the factory to take action, so that non-operation is prevented.'



*Managing Director Gert-Jan Spierings of Bato Plastics expects a turnover improvement of 10 to 20 percent thanks to the introduction of the new MES- System.*

## LeaderMES is focused on Plastics Processing

Israeli software company Emerald launched a system with LeaderMES with which producers of plastics can optimally control and manage their production. This leads to less material and energy consumption and higher labor productivity. With the introduction of LeaderMES in July 2006, Bato Plastics was the first company in the Benelux countries that uses the new MES System. For the time being, the basic version is used in this company. However, LeaderMES contains extra modules that further increase the grip on production.

The information the basic version of LeaderMES automatically makes available is related to, among other things, cycle times, breakdown

times and the consumption of material for each production run at each machine. Employees can add their information to that in standard screens, such as the reasons for breakdowns and non-operation.

They can see on a diagrammatic traffic light where production is taking place and whether said machines run well. Each machine has its own traffic light. 'Red' means that the machine has stopped running'. 'Orange' means that the machine runs, but that the cycle time is located outside the bandwidth. 'Green' means that that the machine runs within the bandwidth. Thus adjusters don't have to go there to check.

## PDA offers a solution

It took a couple of years before Bato actually purchased an MES-System. Spierings: 'The link of the software to the injection-molding machine has been the bottleneck for a long period of time. We didn't want a cabinet on the machine and computer screens in the hallway. The production people would then still have to walk around a lot between the machines, whereas I specifically wanted to avoid that.'

All of a sudden, technology became available whereby we could work wireless with PDA's (Personal Digital Assistant) and a web-based Wi-Fi technology. This offered the possibility to follow the statuses of machines and production-runs on a PDA-Screen via the Internet in real time. The moment this item was solved, the trajectory went quickly. We purchased LeaderMES and implemented it in July 2006.'

## More Exchange, other Work

In this whole trajectory, Bato Plastics works closely together with GejaPLAST, specialist in process optimization and high-quality computerization solutions for the plastics industry. In de Benelux countries, GejaPLAST represents the LeaderMES system of the Israeli producer Emerald (please refer to the article below). 200 hours support has been included in the standard package. Gerrit van de Ven (GejaPLAST) explains why it is time-consuming: 'This time is necessary for the physical implementation of the system and training of the employees. They have to follow the software structure to be able to use the benefits of the MES-System. The system contains an open database with links to both the machines and the company's ERP-system. Everyone in the company has access to that database when web-based interaction is involved. Customers of Bato can also follow production.'

His colleague, Jago Lachmeijer explains why the system leads to more intensive data streams through the whole company: 'First this has to do with the information produced by the MES-System. This information originates partially from the machine itself. At the helical mechanism of each

You can read about how working with LeaderMES exactly functions in practice in the report about the injection-molding company Bato Plastics in Zevenbergen. Here the standard version is being operated. However, the MES-System also contains extra modules that further increase production control – enhancing process efficiency and therefore productivity.

**Injection Process Control (LeaderIPC)** This module is specifically intended for injection-molding. It enables injection-molding operators to manage things like product weight and energy use. If products threaten to get outside of the bandwidth of their weights, alarm signals are sent out, after which the machine can be stopped or any settings can be optimized. The information that results from LeaderIPC can constantly be used as the basis for decisions around mold maintenance. In addition, problems such as closed filters or hot runners and cooling problems are observed by the use of IPC before problems occur with the machines, molds or products.

## Bato Plastics

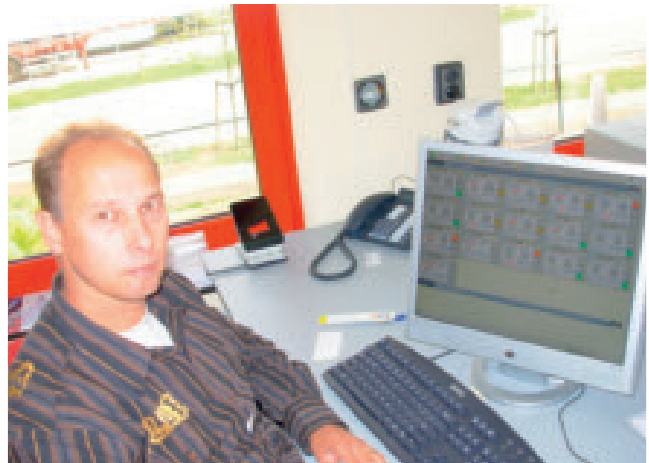
The company Bato Plastics in Zevenbergen uses injection-molding to manufacture products for the business-to-business market. It has 25 employees. The products can be divided up in three groups:

- Products for food truck farming, among other things made of bio-degradable material
- Packaging
- Custom-made, often Technical Products

**Bato works with 31 injection-molding machines with 50 to 750 tons closing power. The company processes almost all plastics and has more than 2K production. Production takes place 24/7, with unmanned production between 'six and six.'**

injection-mold machine, an electronic link is located that measures helical movements and cycle times, and registers any non-operation.

"Besides that, employees enter a menu in their PDA-Configuration regarding production increases, such as the start of the conversion, start of the production and reasons for breakdowns. All these data are automatically entered into the ERP-System via wireless technology. At the office, analyses can also be used for it. The outcomes of those analyses can then again be discussed with the employees,



Similar to other employees, John Woestenberg can oversee at a glance how the machinery operates. That saves a lot of walking alongside the machines.

Historical IPC-information can serve as a sound basis to compare different runs on the same mold, so that problems can be spotted and specific improvement steps taken. Not only can non-operation be reduced with IPC but even prevented. IPC warns during a tendency in process conditions, even before production takes place outside of the bandwidth.

**Advanced Scheduling** With this module, the most cost-effective work plan is automatically determined, including all relevant factors, such as:

- Machine expenses per hour
- Historical and actual cycle times of products on different types of machines
- Material inventory
- Delivery times
- Late delivery
- Calendar restrictions such as vacations, night shifts
- Shortest machine set-up time



*In the production hall of Bato Plastics there is now a lot more rest since the introduction of Leader MES.*

so that work can be done specifically about process improvement. LeaderMES automatically delivers production data for post-calculation in connection with invoicing. That leads to changes in the work of the administrative department. With the same amount of people, for example, a larger production can be managed by the administration. So you can envisage that, during implementation of the new system, all employees have to be thoroughly prepared for increasing information streams and changes in the nature of the work."

## Experiences on the Production Floor

In order to check how the work with the new system is experienced, we went into the production hall. Quality control associate Corn van Sliedregt remarks that there is a lot more rest on the work floor. 'Colleagues walk a lot less up and down and consult me less, so that there is a lot more time left over to adjust the machines. I can automatically book in previously discarded products preventively if they turn out to be in order. It is a pity that we can now only click

In the first place, it is impressive that the company Emerald succeeded in integrating all these factors into the calculation of the optimum work plan. To this is added that the complexity is increased by the number of machines, molds and products that are worked with in an injection-molding company.

Mathematicians and economists worked for months on the development of the underlying models and algorithms of this Advanced Scheduling-Module.

It is also noteworthy that during the calculation of the optimum work plan, Leader Advanced Scheduling doesn't start from standard data but from actual production history. The system thus stores the actual historical cycle times of different products on different machines. During a new order, the available machine is recommended that has been proven the most efficient for the production of the product in question. During large production amounts, this option leads to significant savings. Also during smaller production amounts, the possibility of the system to recommend the machine with the shortest set-up time and processing leads to significant savings, especially when there is a lot of conversion.

on standard options in the MES-System for issues caused by machine breakdowns. I would like to see that we can add our own commentary to those options in an available textbox.'

Operator Alfred van Zundert is also positive about the new system. 'There is indeed more rest. I think that this PDA is a solution. On the diagrammatic traffic light screen you oversee at a glance how the machines run, so that you don't constantly have to walk along the machines to check if everything is running well. I can now immediately go to those machines where I have seen on the screen that the production is not going as it should.'

## Changes in the Back Office

In the office we spoke with John Woestenberg, project leader during the implementation of LeaderMES. He goes more deeply into the advantages of this system. 'Due to the extensive possibilities for analysis, we can better manage the processes. This is how we can compare the actual production data from Leader with the pre-calculation of our ERP-System. Previously not all breakdowns were identified because personnel did not make a note of each breakdown in the books. It is also not possible to talk to all the employees about that.

Nightly breakdown times were already completely unknown. During longer production runs of multiple weeks, the consequences of the nightly breakdowns were visible too late, sometimes only during the daily output measurements of our machines. The new system automatically detects breakdowns and breakdown times, while the operators linked to the orders give the reasons for said breakdowns. Due to this, we can inform our sellers earlier during delays, and our sellers can tell the customer.'

## The Gradual Road

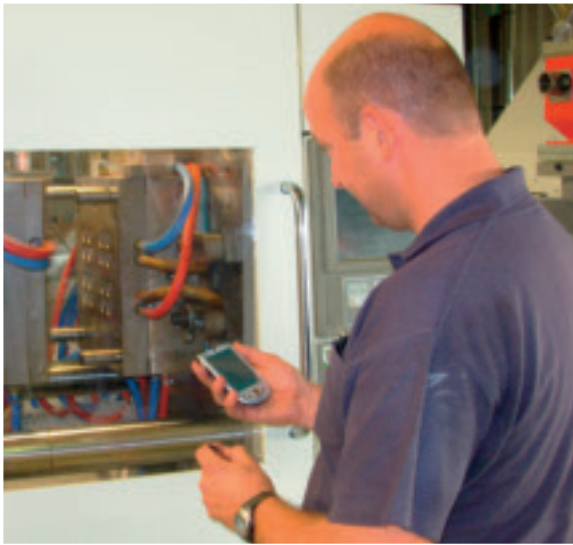
It has already been mentioned briefly that due to the ability to call up historical production information, it is possible to analyze often recurring breakdowns and reasons for breakdowns. Due to this, the weak spots in the production processes become visible.

**Quality Control** In this module, a customer is able to call up all parameters of any production run, including the number of rejects, reason for rejects and the employees involved in a production run. All this is in connection with the importance of transparency and convertibility.

The module also indicates which tests have to be executed or if they have already been executed.

**Maintenance** This module automatically updates maintenance records for all tools, including when maintenance should take place. This is calculated on the basis of actual production hours and numbers instead of intermittently, so that non-operation times are still included.

**LV** LeaderLV shows the consumption of raw materials and additives in real time. During signaled deviations in the material consumption, the system automatically adjusts the dosage. This leads to a minimum material consumption.



*Adjuster person Alfred van Zundert checks the production status of all the machines on his PDA-screen. When a red traffic light appears, he takes the appropriate action.*

This leads to improvement actions that increase the process- efficiency and drive up productivity.

'Bato is not there yet because we have only been working with it a month,' according to Woestenberg. 'This system is an adjustment process for us. We shouldn't demand everything at the same time, because then the employees will go crazy. However, I have already seen that the breakdown times are longer than I had previously thought. There is thus sufficient room to significantly increase process efficiency. A great advantage is that LeaderMES itself calculates on which machines certain products can best be injection-molded, based on historical cycle times and other production information This also increases process-efficiency and saves material expenses'.

## **Twenty Percent more Sales'**

Managing director Gert-Jan Spierings has the same opinion: 'We take everything one step at a time and give the employees time to get used to the new working method and procedures.**When we are completely used to the system, I expect that this investment will lead to ten to twenty percent more turnover. I expect that the majority of the profit will be in the ability to analyze nightly production.**

This leads to improvement actions so that the machines will be out of order less times.'

Bato first purchased the standard package of LeaderMES, but gradually other modules will be invested in. With this, process efficiency can be further be driven up. This way, Injection Process Control non-operation can be prevented and due to Advanced Planning, orders can automatically be allocated to the best machines and operators. 'The next logical step will indeed be to further increase process efficiency using these modules and saving on material use,' Spierings concludes.

**Wim Danhof**