



3M Automotive

3M

Benefits at a glance

- ▶ *Velocity increased from 3.3% to 56%*
- ▶ *Work in progress reduced by 85%*
- ▶ *Order cycle times cut by 90% to 49 hours*
- ▶ *Lead times reduced from 18 days to seven*
- ▶ *Redesigned process area*
- ▶ *Nine out of ten storage areas eliminated*
- ▶ *Improved reliability and quality*

Customer profile

3M Automotive boosts value-added velocity to Class A level

A low-cost investment in Lean Manufacturing methodologies has resulted in 3M Automotive Markets, Europe, increasing its velocity - which measures value added time as a percentage of total time - from 3.3% to 56%. The result has been that the time to satisfy an order has reduced by an extraordinary 90%.

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3M's Hilden site at Dusseldorf is the company's largest plant in Europe. It employs around 1,000 staff and manufactures a range of products for the automotive industry, traffic and safety products, such as reflective sheeting, and commercial graphics.



“We have established a stable process with Kanban systems and reduced lead times from 18 working days to seven, and order cycle times have reduced by 90%.”

Manfred Stehl
European Manufacturing Manager
3M Automotive

At the end of 1999, Peter Hill, an Associate with business education consultants Oliver Wight Europe, was helping the company to implement Sales & Operations Planning at the plant. He challenged European Manufacturing Manager Manfred Stehl and his team to slash the cycle-time for a product range from eighteen days to two as part of a World Class Manufacturing (WCM) process acceleration initiative.

Manfred Stehl comments: “We liked the idea of making a huge step change in our processes rather than a series of incremental ones. It was important for the project’s success that we had top management commitment so a number of senior plant managers attended an Oliver Wight 4-day course in the UK.”

3M decided to proceed with the WCM initiative at Hilden’s Automotive & Tape Module (ATM), which employs around 240 staff. It chose to focus on the company’s Dual Lock pressure sensitive tape products which are used for bonding car components such as trims, nameplates, wheel and pillar mouldings. Manfred Stehl adds: “We make 150 variations

of Dual Lock acrylic foam tapes and it is our most complex product in terms of the manufacturing processes involved. These include making and curing the tape in a 51 metres long infra red oven, slitting the rolls, die cutting and finishing operations. We reasoned that if we could reduce these lead times we could do the same to any of our other products.”

By mid-2000 Oliver Wight Associate Ray Padilla organised a 5-day workshop at Hilden. The workshop was attended by a multi-functional team which included staff from the logistics, process engineering and quality engineering departments, and shift leaders and operators to maximise shop floor involvement.

During the education and training phase of the programme, the team used techniques such as the Seven Forms of Waste, Flowcharting, Pareto Analysis, Dashboarding, Brainstorming, Team Dynamics and PDCA (Plan, Do, Check, Act). It was important to thoroughly understand the current processes and document them on large wall charts to see exactly what was happening in the 200 metres square Dual



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Peter Hill
Associate
Oliver Wight

Lock production area. One surprising revelation was the large number of storage areas utilised.

The core team analysed the current processes for Dual Lock. “We subdivided the process/activities into value added and non-value added times,” says Logistics Supervisor Thomas Fass. “We discovered that due to factors like storage areas, which incurred high non-value added time, our Velocity - measured by value added time divided by total time multiplied by 100 - was just 3.3% for an order cycle time of 18 working days. To be Class A in terms of Velocity means achieving 50% plus, so we had a long way to go!”

The team defined a series of very ambitious goals:

- Increase Velocity to over 56% by reducing or eliminating non-value added time
- Reduce Work In Progress by 85%
- Reduce cycle time from six weeks to 48 hours

The team then developed a detailed implementation plan allocating the areas involved, their actions, responsibilities and timelines. Weekly meetings were held to discuss

progress and to implement and drive the PDCA (a universal process for Continuous Improvement),

“We completely re-designed the process area and established Kanbans in four or five areas,” says Thomas Fass. “We eliminated nine storage areas, leaving us with just one for WIP, and reduced the production floor area to 40 metres square. Other improvements included resiting an oven and cool-down area, establishing a Pull system, and operators were also given more responsibility and freedom. For example, blanket production orders are now triggered by operators rather than by the planning department.”

Manfred Stehl comments: “We were really impressed by the results of the WCM initiative which has taken six months and an investment of just £40,000. Effectively we have moved from batch to flow process and from a Push to Pull system. We have established a stable process with Kanban systems and reduced lead times from 18 working days to seven, and order cycle times have reduced by 90% to an average 49 hours. In addition, we have more flexibility and



no more ‘rush’ orders. A key factor in achieving the results was a policy of education through communication, and the adoption of an educational game which explained to the workforce in simple terms what WCM means and why it is important to the company.”

The next task for the core team and sub-teams is to roll-out the WCM programme to seven more major product lines at Hilden. The results anticipated will differ from product to product with some having a greater emphasis on, for example, quality improvements and Velocity, while another is aiming to reduce WIP to zero. The roll-out plan envisages WCM for all modules by the end of 2001, and will eventually be extended to 3M plants making similar products in Spain and the UK and maybe also to USA and Japan.

The team at ATM is aware that further improvements will be difficult to achieve with its existing IT tools. The company uses a SAP ERP system, but with 2,500 orders processed a month and 10,000 different finished products it is now looking at an intelligent finite capacity scheduler to help

optimise changeover times of materials and products as order complexity increases during roll-out.

Oliver Wight’s Peter Hill comments on the company’s achievements: “This process acceleration initiative is a very good example of what can be achieved when a company gives a group of employees an opportunity to be involved in education on Process Acceleration linked with a results orientated approach. We in Oliver Wight are delighted that a result for 3M Automotive is further confirmation that these Process Acceleration Workshops can be outstandingly successful. The company achieves major financial benefits and employees achieve major job satisfaction. Customers gain from improved reliability and quality of output.”



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Oliver Wight EAME LLP

The Willows, The Steadings Business Centre
Maisemore, Gloucester, GL2 8EY

T: +44 (0)1452 397200
email@oliverwight-eame.com

www.oliverwight-eame.com

Oliver Wight Asia/Pacific

131 Martin Street, Brighton
Victoria 3188, Australia

Oliver Wight Americas

P.O. Box 368, 292 Main Street
New London, NH 03257, USA

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