

The main event

Vince Grant details a kaizen event that brought remarkable success to Ecophon in Sweden

Helsingborg, Sweden is probably best known today as the global headquarters of IKEA, although it is also famous as the ferry crossing to Helsingør, Denmark where Hamlet's castle stands. But, just down the road from IKEA, is Ecophon, a subsidiary of French multinational Saint-Gobain that manufactures acoustic tiles for ceilings and walls from recycled glass. Ecophon has deployed a lean six sigma programme for several years and has sustained ongoing improvements to its manufacturing operations as a result. One such improvement is a reduction in changeover time on its number five production line, which is designated for "special" products.

Ecophon operates a number of production lines, but number five is special, not only in the sense that it manufactures custom-designed special products for individual customers but also because, as a result of that, the number of production changeovers is especially high. It is well-known that long changeover times are a barrier to migrating to the single piece flow essential for smooth lean manufacturing, but the loss of production time can itself be a major waste if the volume of changeovers is unusually high. This is indeed the case for any production line manufacturing speciality products.

In the case of line number five there is always a minimum of three changeovers in every eight-hour shift taking an average of about 40 minutes each. Simple maths showed that this resulted in a loss of two hours' production in every eight. In response to this realisation, lean six sigma leader Lena Hallkvist prioritised reducing changeover time on this line as one of Ecophon's improvement activities. For this type of improvement the clear and obvious choice of approach was a type of kaizen event known as a "single minute exchange of die, led by Geoff Noble of Catalyst Consulting.

The event

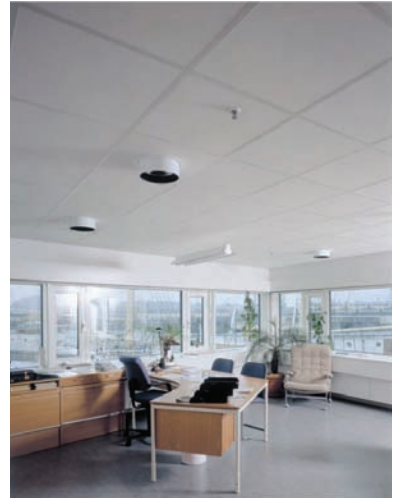
The improvement activity followed the standard approach adopted in Ecophon and in many other companies for this

type of event. The event lasted a full week in December 2008, preceded by careful planning and organisation. Katrin Andersson, who led the improvement team with Lena Hallkvist, commented that without this it would not have been possible to make improvements in real time and sustain ongoing production. "There is a big difference between leading a traditional six sigma project where you have time to think and reflect and a kaizen event where everything is happening in real time," she said.

A kaizen event has a typical format. The team meets together with the champions at the start of the week and gets organised. The first order of things is to see how the current activity or process is actually working and then diagnose the problems and their causes. From that diagnosis the team develops, prioritises and proposes improvement actions that it then tests out in the live operating environment. The team then summarises its recommendations to the champions who rejoin them at this stage. The general understanding is that these recommendations will normally be supported and implemented, unless the champions have exceptional reasons for not doing this.

On the first day of Ecophon's event, a short training session for the improvement team was given outlining key principles of lean production and illustrating the main tools and techniques the team would likely be using. That afternoon the team effectively completed the define stage of the lean six sigma DMAIC (define-measure-analyse-improve-control) improvement methodology and focused the project scope on the specific areas where the team believed the best results could be secured.

The second day was focused on the measure and analyse steps of DMAIC. It was essential that the team had a clear picture of the changeover process as it was currently operated. To assure this, Katrin and Lena arranged to video a number of changeovers. Two separate cameras were used





Production line manufacturing at Ecophon

Opposite page: Acoustic ceiling tiles

to record the changeovers from different angles. Although video capture had been used before in lean six sigma projects at Ecophon, any reluctance among the production operators was overcome by involving them directly in the filming. The changeover times were measured without the team on the line knowing in order to avoid influencing the outcome. The results were analysed in various ways, including developing a value stream map and an accessible cycle time analysis.

On the third day the team split into small sub-teams to develop improvement suggestions in line with the improve phase of DMAIC before re-assembling to collectively select those to be tested. Excitement mounted as they prepared to test their ideas on the live production changeovers scheduled for the following day.

On the big day itself the changes were tested and refinements made in line with the outcomes. The modified changeovers were videoed in a similar manner to the earlier changeovers used to identify the problems and their causes. By the end of the day the team had managed to reduce the average changeover time by 12 minutes. The improvements made included:

- Developing and using detailed operating instructions
- Purchasing and installing an extra piece of measuring equipment
- Mounting a scale in the machine to make adjustments faster
- Improving the automation through programming changes.

In line with the standard kaizen event format the team presented its improvements to the entire local management team and the wider operations staff on the final morning of the event.

At this stage the improvement team had been able to reduce the changeover time from 40 to 28 minutes. The impact of this was an immediate 8% improvement in the overall equipment effectiveness of the manufacturing process. Of course the kaizen was not finished here as the control phase required the progressive implementation of further improvements that had been identified and the ongoing measurement and monitoring over several weeks following. The eventual result was a sustained ongoing waste reduction and productivity improvement amounting to more than €100,000 a year ■