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## Lean Manufacturing at Micralyne

Micralyne is expanding its production capacity including the construction of new Class 10 clean rooms, more inspection and assembly space, and the acquisition of new processing equipment.

When undertaking such an expansion, it presents an opportunity to reexamine our manufacturing infrastructure and implement changes that could improve cost efficiencies, yields and cycle times.

In particular, Micralyne is applying the concepts of lean manufacturing to this new space to complement other lean activities being implemented in our current process flows and existing manufacturing space.

As the person in charge of implementing lean practices at Micralyne, I often get asked questions on what it means to be “lean” and how lean practices can be integrated into a company’s day-to-day operations. Some of the questions are answered below:

### What exactly is “Lean Manufacturing”?

The concept of lean manufacturing has been around for several years and its aim is to efficiently produce high quality products through the elimination of waste.

In general, there are seven standard types of waste to identify and eliminate, including:

1. Producing defects
2. Over production
3. Waiting
4. Unnecessary motion
5. Excessive inventories
6. Inappropriate processing
7. Transportation

### What is Micralyne doing for Lean Manufacturing initiatives?

The first step was to get everyone in the company introduced to lean concepts. Workshops were conducted for senior executives, managers and lead hands, followed by an introductory course for remaining staff.

We then decided to target the value stream of one particular customer with whom we have supplied to for many years. This value stream is one of our longest running lines and is well understood. Having a ready supply of data and manufacturing

history is very important for identifying and eliminating waste.

To drive lean manufacturing practices for this particular value stream, a Kaizen team, including operators, engineers, sales and management, was created. The Japanese term Kaizen is used because it means ‘to make better’ or ‘to improve’, both key concepts to becoming lean.

The first major task the Kaizen team undertook was to map the current state of processes. This involved physically going to the shop floor and timing each step in the process, tracking movements and making observations. During these observations, it was extremely important for team members to ask “why” questions such as “why do we do it this way?”. By asking these questions, we were able to eliminate practices that, with fresh insight, were in fact wasteful. Any signs of waste were recognized and recorded. Totals for operator, machine and setup times were then compiled and analyzed. From this, improvements were recommended.

The final step, currently in progress, is to measure out the improved state, allowing for setup reductions, work balance, and the eventual design of a new layout to better serve the product flow. This will potentially tie into our facility expansion or require a reconfiguration of our current set-up. As well, we have assigned the engineering resources to streamline and implement the recommendations from the current state mapping. This process is then repeated for another value stream.

**What have we learned so far?**

Overall, we have discovered many ways to implement lean practices both in the short and the long term. In the example noted above, we determined that the amount of time it takes to complete the fabrication of one device for this particular value stream could potentially be cut in half. In particular, relocating the positions of tools can reduce the moving time for an operator, allowing more time to be spent on the actual process steps.

Simple examples like this can, over the course of a year, have a very substantial impact on reducing costs, which is our ultimate target. With more time being spent on the process versus traveling time, more MEMS devices can be produced and shipped to customers faster. More importantly, fewer working hours are required to produce each product.

Lean manufacturing is a very simple concept, but one that can be difficult to implement and even harder to sustain. To be successful it has to be integrated into a company’s corporate culture with everybody adopting a mantra of continuous improvement.

If we do this, we will be able to meet the goals of our manufacturing customers when they challenge us to improve product quality, increase efficiencies and reduce costs on an ongoing basis.

**- Mark Belec, Senior Process Technologist -**