

***Your workshop is running at full capacity but you just can't seem to improve your bottom line. Nicole Azzopardi takes a closer look at lean design and manufacturing to see how even the smallest of job shops are saving themselves a bundle.***

# Keeping it clean and lean

**Y**ou know what the problems are but you're just too busy putting out fires to think about why they occur in the first place. The workshop floor is fairly tidy. Your materials are where you left them – most of the time – and you've shaved off all the extra inventory costs you can think of. Sure there are expensive hiccups along the way now and then but doesn't everybody have them?

"Companies that consistently and persistently work to improve their operations using lean tools will be the winners as worldwide competition keeps getting tougher," Munro & Associates consultant John Mr Walker says. A mechanical and manufacturing engineer, Mr Walker provides support to Australian and overseas companies looking to apply lean design and lean manufacturing methods to reduce costs.

Lean design is a Munro-developed process that focuses on design driven waste. The American-based firm has collected data to show that the product design has the greatest impact on the efficient workings of a manufacturing operation. According to the company's research, design has the ability to influence attributes such as floor-space, labour, materials, quality and ultimately profits. A lean design workshop will analyse the product design from a manufacturing perspective and provide new ideas that bear in mind the total costs rather than just piece part cost.

## Grasping the situation

"Lean really forces people to take a hard honest look at what's going on in an organisation's processes," Mr Walker says. Every business is different and will start applying lean with varying objectives in mind but an important first step is to grasp the situation you're in. It makes no sense to jump right into lean manufacturing if you are fighting quality or cost issues driven by design. Stabilising that first and then working with lean tools will be much more successful. One of the reasons for lean's success is due to continually questioning why things are the way they are until



getting down to the root cause of a problem, Mr Walker says.

"Companies sometimes live with these problems because they think it's a normal way of doing business but lean thinking exposes the real costs and applies solutions to address these problems," he says. It's not easy to apply lean and that's why it has not always worked well at locations that have attempted

it. It takes tremendous persistence overcoming obstacles but the results are usually dramatic.

"Unfortunately there are still plenty of companies that are unaware lean thinking applies to them but the reality is that every process can improve by understanding and eliminating waste," Mr Walker says. "It's a continuous journey."



**OzPress' Luke Dwyer used lean tools to help significantly improve his company's bottom line: "It's a global industry now and we have to be as efficient as we can," he says.**

## Up close and personal

How often have you really looked at what you do and thought about why you do it in that particular way and asked yourself: Is there a better way?

According to Mr Walker, companies effective at applying lean have top management who are well versed in lean thinking and tools and take the time to understand how the business is really working on the floor. "The common way of relying on data at a monthly meeting doesn't begin to compare with the effectiveness of viewing and responding to up-to-the-minute status of the process," Mr Walker says.

## Defining Value

"An important component of lean is for people to define value from their customer's perspective," Mr Walker says. "You've got to ask:



**Waste not, want not: OzPress goes through a lean overhaul, using 5s as one of its start off points. The company optimised its layout and product-flow to reduce downtime.**  
**3a) without flow racks**  
**3b) with flow racks**  
**3c) without tool racks**  
**3d) with tool racks**

‘what are the things the customer is willing to pay for?’. If you are forming or stamping a metal part, that’s creating real value but if the part is sitting there for two days waiting for the next operation, that’s not value.”

## Desperation creates inspiration

The ground-breaking manufacturing philosophy came out of Japan after the second world war when Toyota had all but been economically crippled. Enter Toyota’s assembly shop manager Taiichi Ohno charged with bringing the car manufacturer back from the brink. Only problem was there was no money for new equipment to help improve the company’s efficiency.

Often desperation is the cause of inspiration and this was the case for Ohno who set about using his creativity to help bring back Toyota from its knees. The result is the Toyota Production System (TPS) a three-point plan and essential component of lean and a philosophy which helped revolutionise the way manufacturers operate around the world.

## TPS in a nutshell

Make only what the customer wants, when wanted, with quality and at a minimal cost. “The tools and thinking approach provided by management systems such as the Toyota Production System really forces people to take a hard honest look at what’s going on in their

processes and address the issues,” Mr Walker says.

## What’s in it for me?

According to Mr Walker, being aware of how waste can manifest itself is paramount. “It could be in something simple such as excess movement of the product on the shop floor from one machine to the other.” Other areas of waste that lead to higher costs are continually fixing things after they go wrong. One of the tools of lean is to create standardised processes so you consistently get it right the first time. You eliminate the waste of correction and rejection.

But is lean reserved only for vehicle assembly plants and high volume corporations? And if not, how can the average metal shop apply lean? “You know, in many cases companies have their backs against the wall before they will try another way,” Mr Walker says. “A lot of companies are too busy fire fighting to know where to start.”

## Off to see the wizard

With a workforce of just 32 people, metal stamping and automotive component assembler OzPress is one smaller sized operation which decided to follow the manufacturing yellow brick road and take a closer look at lean in 2000.

The Ballarat-based organisation which supplies to Toyota and Victa Lawn Care found

it needed to deal with multi-stage dies which required several operations and different presses. “This allowed for a lot of works in process and a lot of waste,” OzPress General Manager Luke Mr Dwyer says. “We went from carrying a month’s stock of different components to now being down to some of our things being made to order.” Mr Dwyer says most of OzPress’ lean activities are surrounded by the work the company does with Toyota, which require quick-change over time.

## Reducing down time

“We had to find a way to reduce our down time so we could reduce our lot size,” he says. “We found the lean principles things that made sense and could be applied immediately. We don’t use every lean tool but being a small place we focussed on the things that could have an immediate effect on our production.”

Mr Dwyer could see that OzPress had to get its inventory under control and to do that the company realised it had to review its planning processes. Relying on the predecessor of lean, the Toyota-based system of TPS to complete what is called the Kaizen activities to analyse the product’s assembly, Mr Dwyer soon realised the company was doing too much movement.

“We reduced that with simple ergonomic solutions like moving equipment,” Mr Dwyer says. “We re-did our factory layout three or four times till we got to the optimum flow of

our product and by doing that we reduced downtime." It may seem rudimentary but for OzPress, the results were revolutionary.

## Elementary becomes revolutionary

"One part was taking two operators all day to work on and they'd only do 1000 parts," he explains. "By changing the layout of the assembly, we were able to reduce this activity to using one operator and that person was able to achieve 2000 parts a day."

While Mr Dwyer believes some of the principles of lean have been easy to adopt, he admits that others will take more time. "It is about sustaining the practices," he says. "You learn to see things you'd never seen before. You learn to look at waste in a different way. Now having made the change, for Mr Dwyer there's no going back. "It's something we feel we've had to adopt," he says. "If we hadn't, we just couldn't have stayed competitive. It's a global industry now and we have to be as efficient as we can. If we have to use labour, we need to make sure we're not making it hard for ourselves - we have to make it easier."

But will there be a time when Mr Dwyer decides OzPress has reached peak efficiency? "Lean is an on-going thing. We train a core



**OzPress staff use visuals to continually monitor the situation the business is in.**

group of our employees into the 5s and we need to keep on reviewing our practices even when you achieve the goal that you set out for."

## The Kozma experience

Daryl Davis of Bayswater-based metal component plant Kozma Industries knows only too well how positive the results of lean and TPS can be. The seating and brake pedal manufacturer which supplies directly to the automotive industry applied lean and are receiving bankable results.

"From 2005 to 2007 we've increased \$2 million to our bottom line using lean tools," Mr Davis says.


"Because of our strong connection to Toyota we came to start practicing lean in an almost organic way. The essence has been eliminating waste across all facets of our business focussing on the nine waste streams." Honing in on areas such as defects, overproducing, motion, inventory, transportation and untapped resources to name a few, Mr Davis was able to whittle away exercises of non-value that had become part of the furniture at Kozma.

## Store blind

"I couldn't see the waste prior to doing this type of analysis," Mr Davis says. "We knew that we were stopping our customers, it was taking too long to deliver, we couldn't find things, there were parts shortages - we knew what the problem was but we were too busy to fix it."

Like so many manufacturers, Kozma was too busy being busy. Caught in a state of controlled chaos. However, by going back to basics, aligning a core group of Kozma's 160-strong work force to specific business functions in order to analyse their value and non value activities, Mr Davis was able to turn the company around. "This was a crucial element of the change over. The change allowed staff to be more empowered - through, accountability and consequences, both positive and negative. Now we're in a state of controlled stability."

Using a combination of lean and TPS to address the staffing issue, Mr Davis then turned his attention to ordering the warehouse. "Not being able to find things was a major waste area. We focussed down on fixed locations and having everything in its place." Mr Davis says the company applied 5s activities to drive the change. "We live and breathe TPS and we use Kanban which is a visual system to control your production requirements."

The result helped to make Kozma lean in terms of stock holding and work in progress. "When you can reduce waste in how long you hold on to stock then you have enough space in your warehouse to put things where they belong," he says. "It's all interconnected, it's simple and it makes sense." According to Mr Davis, the key to lean is realising that it starts and ends with staff. "Lean is all about your people. It's important for a business to understand its position and then choose the right tools to bring in the improvement. The rest of the changes just flow on from there." 

**Recommended reading:**  
[www.lean.org.au](http://www.lean.org.au)  
[www.toolingaus.com](http://www.toolingaus.com)  
[www.leandesign.com](http://www.leandesign.com)

## Want to know more about lean?

Lean manufacturing is an intricate philosophy that is best applied rather than read about. However, to help you get acquainted, one of the common lean tools to look at is how to keep things standardised.

The Standardisation Principle follows four key elements.

### 1. Workplace Organisation (5S) – Everything in its place

5S is a reference to a list of five Japanese words which start with S. 5S is a philosophy and a way of organising and managing the workspace. The key impacts of 5S is upon workplace morale and efficiency. By ensuring everything has a place and everything is in its place then time is not wasted looking for things and it can be made immediately obvious when something missing. The real power of this methodology is in deciding what should be kept and where and how it should be stored. This dialogue builds good clear understanding amongst a workforce of how work should be done and instills an ownership of the process

when done effectively. The 5S are:

Seiri: Tidiness, Organisation  
 Seiton: Orderliness  
 Seiso: Systemised cleanliness  
 Seiketsu: Standards  
 Shitsuke: Sustaining discipline

### 2. Management by Takt Time

Determines the speed of the line, the time available to produce a component or single unit. Determined by the number of parts required by the end of each day to meet the production target.

### 3. Standardised Work

A method to safely and efficiently perform work that meets the necessary level of quality.

### 4. Visual Management

Tools to help us understand what is happening on the shop floor. See and hear abnormalities. Make decisions and take immediate action. Communicate efficiently and effectively.