BFA 2013

celebrating manufacturing excellence

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Top of the class

Dr Marek Szwejczewski reveals some of the factors that have set apart this year's Best Factory Award winners from others in the sector

Following several lacklustre years, the economic indicators suggest that UK manufacturing is finally showing signs of continued growth. While the 2013 Best Factory Award winners have not been totally immune from the impact of the last five years, they have been diligent in their unrelenting drive for excellence. The Best Factory Awards provide us with a great opportunity to recognise and reward those excellent factories that have quietly and consistently improved their operations, and created world-class plants.

Reviewing this year's best factories, it is possible to see common traits and trends. One of the encouraging trends that can be seen this year is that manufacturing is coming home. Several of the plants have been able to attract production to the UK due to competitive labour cost, skilled employees, workforce flexibility and excellent quality. This movement has also been influenced by customers who demand short lead times and it has gone along with increasing transportation costs and pressure to reduce stocks in the supply chain – all making a strategy of manufacturing offshore no longer attractive.

As in previous years the winners had a clear manufacturing strategy, which was cascaded down the organisation to the factory floor. They were customer focused and continuous improvement was part of their culture – just something they naturally did. The factories also shared several other characteristics that were prominent this year.

The best factories have been cutting their inventory levels: not just WIP, but raw material and finished goods stock levels. This has been achieved by reducing batch sizes, improved planning and implementing pull production.

The winners have improved their factories' flexibility by compressing lead times, reducing set-up times and developing multi-skilled workers. This characteristic has given them a competitive edge compared to competitors in other countries, where flexibility is not valued and employees are reluctant to work flexible hours or weekends.

"**drive** for excellence"

Many of the winners have adopted Six Sigma and integrated it into their established lean manufacturing system. In fact, the use of lean and Six Sigma is becoming the norm in many sectors.

One of the reasons behind the winners' success has been the fact that they have constantly innovated – by developing new products and, importantly, through process innovation.

The factories have also reduced their energy consumption; through various simple actions combined with investment in technology and equipment, firms have been driving down their costs and helping to improve the bottom line.

The winning factories show that manufacturing excellence is achieved by the commitment and actions of the workforce and management. We are proud to acknowledge and celebrate the achievements of the 2013 Best Factory Award winners.

Dr Marek Szwejczewski
Director, Best Factory Awards
Cranfield School of Management

Welcome

Best of British

For the fourth successive year, we are proud to be associated with the Best Factory Awards as headline sponsor. This also our eighth year of involvement with the awards, during which time we have seen a massive change in the world economy with unprecedented pressure on business efficiency in order to survive. It is heartening to see that British manufacturing is emerging from the recent recession in such fine form – the sector is playing a vital role in the UK's economic recovery.

As the world's number one manufacturer of materials handling equipment, our business is driven by the Toyota Production System (TPS) which focuses on quality, cost reduction and on-time delivery. TPS has enabled our business to grow and develop despite the harsh economic climate, so when I am asked about our involvement with the Best Factory Awards, it is for the same reasons. British factories are embracing lean technology and processes more than ever – and they are reaping the rich rewards of creating world-class products, with a strong focus on cost and customer service.

By being associated with the awards programme, we can give something back to this industry, recognising those businesses that make a difference and are rightly proud of their achievements.

The Best Factory Awards have a superb reputation for the professional assessment criteria applied by the judges from Cranfield School of Management – to be shortlisted among this stellar group is truly something special. What's more, every site that enters will gain a valuable insight of how they can improve, thanks to the benchmarking report that each entrant receives.

It is a privilege to attend the awards ceremony and to feel the tension, atmosphere and anticipation of all those waiting to find out what they have won. We are delighted to be part of a programme that celebrates passion, commitment and British manufacturing excellence.

Tony Wallis
Sales and marketing director, Toyota Material Handling UK

Eight seen nothing yet

Olá, namaste and ni hao. This year's Best Factory Awards mark the launch of an all-new export prize, where we celebrate UK manufacturing's great international adventurers.

It is apt, therefore, that the 2013 BFAs will be held for the first time in the surrounds of London's 8 Northumberland Avenue, because eight is considered a very lucky number in the most idolised export market of them all, China.

In China, when pronounced in the native tongue, the number sounds very close to 'fortune'. So adamant are the Chinese of the feted power of eight that a telephone number featuring all eight digits reportedly sold for more than £200,000 in Chengdu.

The Chinese are definitely on to something here. Many of our finalists who come to 8 Northumberland Avenue have found their luck to be very much in, amid the whir of rickshaws. The headlines may centre on the export success of British-made luxury cars among wealthy Chinese businessmen. Yet, in reality, cool Britannia has reached out from beyond the backseat of the latest Range Rover Evoque and into the hearts of wider Chinese society.

UK-made goods are a byword for quality and spark something akin to Beatlemania in Beijing and beyond. From UV inks to packaging, she loves you and you know you should be glad. Yet, at an industry-wide level, our manufacturing exports disappoint. The trade deficit stands at £8.2 billion and we haven't had a surplus since 1984. We lag behind Germany and France in exports to supercharged BRIC nations. On current form, BRIC exports won't make up the majority of our orders until 2047.

We can't simply sit back and wait out the next 34 years. If we're serious about rebalancing our economy, we have to translate the success of our 14 finalists to national level. The world waits for no manufacturer.

Max Gosney
Editor, Works Management

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2013 Best Factory Award

Factory of the Year 2013
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Winner:
Sony UK Technology Centre

Best Process Plant
Sponsored by Schaeffler

Winner:
Fujifilm Speciality Ink Systems

Best Engineering Plant
Sponsored by PEME

Winner:
Bosch Thermotechnology

Best Electronics & Electrical Plant
Sponsored by PP Electrical Systems

Winner:
Sony UK Technology Centre

Highly Commended: Eaton Production International
Highly Commended: Siemens Industry Motion Control

Best Household & General Products Plant
Sponsored by QiSOFT

Winner:
Milliken European Airbag Products

Highly Commended: DS Smith Packaging
Highly Commended: Tata Global Beverages

Best SME
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Winner:
Tharsus Group

Highly Commended: EMS Radio Fire & Security Systems

People & Skills Development Award
Sponsored by EAL

Winner:
Siemens Industry Motion Control

Highly Commended: Tata Global Beverages

Supply Chain Award

Winner:
Milliken European Airbag Products

Highly Commended: DS Smith Packaging

Most Improved Plant
Sponsored by S A Partners

Winner:
Cummins Power Generation

Highly Commended: Fujifilm Speciality Ink Systems

Export Award

Winner:
Cummins Power Generation

Highly Commended: Fujifilm Speciality Ink Systems

winners

BFA 2013 BEST FACTORY AWARDS Celebrating Manufacturing Excellence

Health & Safety Award

Sponsored by IOSH

Winner:
Bosch Thermotechnology

Highly Commended: EMS Radio Fire & Security Systems

Innovation Award

Sponsored by Epicor

Winner:
Sony UK Technology Centre

Highly Commended: Bosch Thermotechnology

Energy & Environment Award

Winner:
Eaton Production International

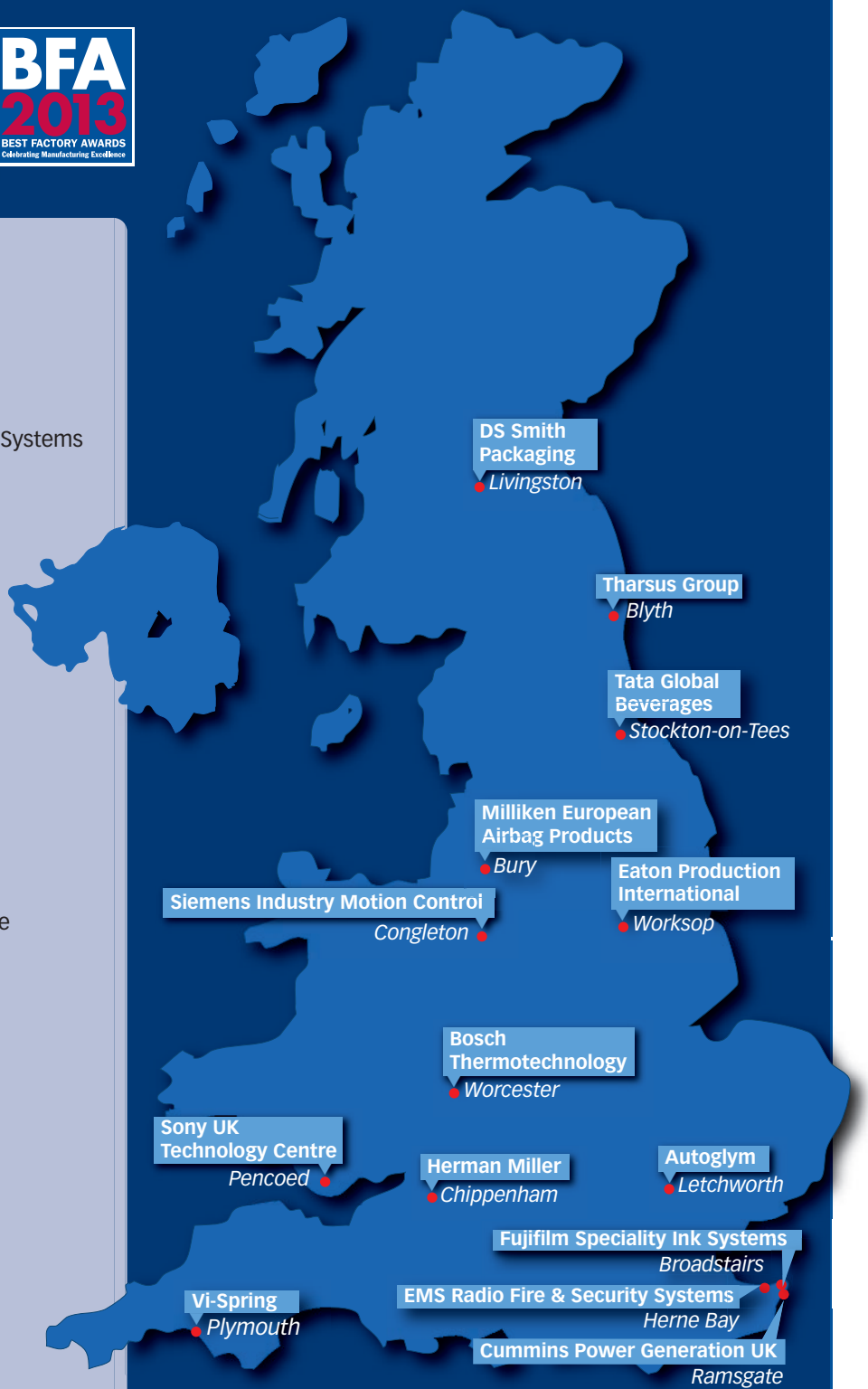
Highly Commended: Bosch Thermotechnology
Highly Commended: Sony UK Technology Centre

Judges' Special Award

Sponsored by Cranfield School of Management

Winner:
Tata Global Beverages

Highly Commended: Autoglym
Highly Commended: Herman Miller
Highly Commended: Vi-Spring



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Sony UK Technology Centre

Winner: Toyota Material Handling Factory of the Year 2013
Winner: Best Electronics & Electrical Plant
Winner: Innovation Award
Highly Commended: Energy & Environment Award

The **big picture**

The accommodation of 50% more workload in man-hours over the past two years at Sony UK Technology Centre has reaped abundant rewards, the latest of which is the coveted Factory of the Year 2013 prize

It's been quite a year for the Pencoed facility of Sony UK Technology Centre (Sony UKTec). In line with its mid-range plan through to 2015, the plant has implemented a multi-point strategy of attack that's witnessed new 'whale-sized' business wins, greater process innovation through automation, increased tenant occupation within its Business Incubation Centre and the introduction of overhead-cost-down initiatives. These aims and many others have been achieved with close ties to divisional objective matrices and individually defined goals; pretty impressive for a factory that only diversified away from television manufacture as recently as 2004.

When this 350-employee facility first commenced the production of broadcast and professional camera systems, it had a mountain to climb. Shifting from high-volume, short takt time television manufacture, to low-volume, multiple-model camera systems meant increasing its skills base, engendering greater staff engagement and essentially redesigning its entire manufacturing operation.

A good measure of the plant's success is reflected by its ever expanding list of customers and markets. The company's broadcast camera systems are now used by household names such as the BBC, ITV and Sky Sports, as well as international giants like NBC, CNN and Fox Sports, to name but a few. In turn, this has inspired diversification into contract manufacturing markets such as medical electronics and renewable energy. In total, 86% of completed products at Pencoed are exported.

Arguably the biggest success story of 2013 surrounds the Raspberry Pi, a credit-card-sized, single-board computer released last year for the intention of teaching basic computer science in schools. Faced with some "challenges" emerging from the decision to manufacture initial volumes in China, the Raspberry Pi Foundation heard about the collaborative contract manufacturing services offered at Sony UKTec.

"We did some analysis and put forward a production solution, along with a successful bid for the contract," states Richard Wilkins, senior manager and head of plant quality and innovation at Sony UKTec. "The Raspberry Pi now has its own production area that exploits Sony skills and procedures, and all the quality benefits this affords."

Since Q3 2012, Pencoed has shipped no fewer than 1 million Raspberry Pi units. Commanding the attention of 22 operators, peak operating rates are in the order of 48,000 a week. However, if the Raspberry Pi is the aforementioned 'whale', then there are plenty of big fish besides when it comes to the uptake of collaborative manufacturing services at Pencoed.

Previously manufactured in China, the CyDen intense-pulsed light hair removal device commenced production at Sony UKTec 12 months ago using 16 operators. Similarly, LRL energy-efficient street lighting arrived at Pencoed after its Canadian owners wanted a European partner. Seven Sony UKTec operators are engaged on this product. Through innovative use of existing space at Pencoed, all of the new third party products have been introduced without increasing overheads.

Aside from the success of its third party contract manufacturing, the production of system cameras for outside broadcast and studio use remains core business at Pencoed. Engaging 103 »

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Sony UK Technology Centre

Winner: Toyota Material Handling Factory of the Year 2013
Winner: Best Electronics & Electrical Plant
Winner: Innovation Award
Highly Commended: Energy & Environment Award

employees, more than 13,000 units per year are produced across 60 different product types. Such has been the impact that the site has recently secured additional Sony business. For instance, Pencoed now manufactures 300 professional Sony camcorders a month across five different models using 18 operators.

In the production process at Sony UKTec, components leave the warehouse and head for automated or manual PWB mounting operations; or to the clean room for prism and optical head assembly. The two paths merge (along with the power supply) at the general assembly stage. From here, subsequent test, QC, packing and despatch make for a slick operation.

The production strategy evolves every year. For instance, in assembly, C-shape lean cells have recently been replaced with true single-person cells. Using the seven wastes to help define the transformation, the result is an impressive 30% greater efficiency. Furthermore, one person means one serial number, which helps impart quality accountability.

The new one-person assembly cells are known as 'SuperAssy', a word derived from the Japanese subarashii, which means fantastic. Based on a common format to accommodate any model, any time, the common assembly stations feature automated operation standards. Electronic displays provide step-by-step work instructions and jig identification, as well as aid rapid changeover.

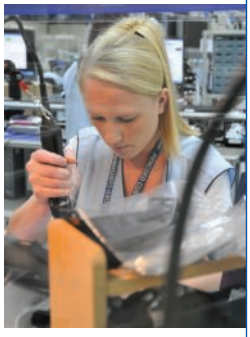
Similarly, the test cells at Sony UKTec have undergone considerable improvement. These 'SuperTest' cells have evolved from manual testing with several operators to a new format using a single operator overseeing four automated test stations. In combination, the new assembly and test 'SuperCells' have contributed to an increase in overall efficiency greater than 50%. No surprise then that Sony UKTec is not just this year's Best Electronics & Electrical Plant, but also a worthy winner of the Innovation Award.

Of course, all this production expediency is dependent on an efficient supply chain for the site's 21,500 part numbers. Here, Pencoed excels using a number of initiatives that have led to considerably reduced inventory (and cost) for raw materials. For instance, the company recently staged its first Sony/ESTnet supply chain event.

"We link up with other electronics and automotive companies in Wales to explore supply chain initiatives that might be mutually beneficial," says Wilkins. "For

TOP 3 POINTS

- Accommodated 50% more workload in man-hours over past two years
- New contract to manufacture the Raspberry Pi, producing 42,000 a week
- Introduced 'SuperCells' to boost assembly/test efficiency by 50%



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Sony UK Technology Centre

Winner: Toyota Material Handling Factory of the Year 2013
Winner: Best Electronics & Electrical Plant
Winner: Innovation Award
Highly Commended: Energy & Environment Award

instance, if we have parts that are the same or very similar, which are currently being made overseas, we use this event to see if any suppliers in Wales or the UK can offer a manufacturing solution. This often yields competitive pricing advantages as well as lead time and inventory benefits."

In terms of staff engagement, key events of the past 12 months include the introduction of personal development records and a new plant bonus scheme, which is weighted equally on innovation participation, new learning and development, and values and behaviours. Furthermore, the continuation of so-called 'red jacket days' are the epitome of staff participation. These regular innovation events allow each production area to drive self-defining and self-governing improvement initiatives.

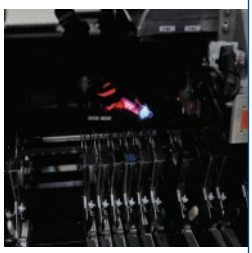
Underpinning all of the company's engagement and improvement initiatives is an intensive training programme. The company's Learning Academy features a dedicated central hub and a roadmap showing clearly defined objectives and actions that embrace core skills development, leadership development and new staff induction. Cross-training initiatives are implemented using flexibility charts and skills matrices.

Based on a central database of skills, knowledge is measured both before and after training. In the past 12 months, some 301 team players received on-the-job/key skills training, while 191 were subject to induction/core skills training. A further 409 received leadership training, typically ILM accredited.

As a consequence of its efforts in staff engagement and training, the Pencoed site recently achieved its best ever Sony global survey result for employee satisfaction.

Conducted by Towers Watson, all employees were quizzed on 52 questions ranging from leadership, engagement and innovation, through to talent management, climate and supervision. Not only did all categories show an improvement over the previous survey a year ago, but the result proved to be the best across the entire Sony Corporation.

From a green perspective, the goals here are clear. The company has established a working group to target energy reduction and waste in its processes. The aim is to inject sustainability into the manufacturing culture without compromising competitive advantage. The result of this investment in time and resources has led to a 5% reduction in energy use over the past 12 months, as well as impressive improvements in waste recycling rates as the company pushes towards its long-term ambition of zero carbon footprint. The next initiative involves the generation of renewable energy on site at Pencoed, which is currently in consultation. Ultimately, enough drive and determination to secure a Highly Commended in this year's Energy & Environment Award.



Beyond its own ambitions, the Sony UKTec Business Incubation Centre demonstrates that Pencoed is truly the home of innovation. Nearly at capacity, the BIC presents young but flourishing businesses with the opportunity to become part of a shared community of like-minded people. It is already home to many independent companies from sectors such as digital technology, renewable energy, media and gaming.

As an all-round performer, Sony UKTec is able to demonstrate admirable business credentials across the board. The improvements made over the past year and its roadmap for the future have propelled the company to world-class status: a worthy winner of the Factory of the Year 2013. ■

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Fujifilm Speciality Ink Systems

Winner: Best Process Plant
Highly Commended: Most Improved Plant
Highly Commended: Export Award

Digitally remastered

A £3 million investment in a new plant, twinned with a determination to get the best out of its people, has helped this Broadstairs manufacturer to reinvent itself in the digital ink age

Chameleons aren't native to the less than tropical climes of North Kent. Yet, nestled beyond the windswept beaches of Broadstairs, lies a haven for the famously adaptable lizard.

Fujifilm Speciality Ink Systems of Pysons Road – once the UK's largest manufacturer of analogue screen inks – has morphed into the top producer of UV-curing digital inks. Since winning a Best Factory Award in 2011, the plant has cranked up the pace of colour change.

A new £3m digital ink production facility has arrived without disruption to customers or to 97% right-first-time (RFT) rates. Employees have moved from part-time improvement enthusiasts to professional CI converts and saved 3,195 man-hours along the way. And Fujifilm has gone international: the billboards of Beijing's shopping centres are ablaze with reds, oranges and blues made in Broadstairs.

"We were a screen company with a digital future," says operations director Colin Boughton, of the site's progress since 2011. "Now our mantra is we are a digital company with a screen heritage." Today, digital commands 53% of ink sales, compared to 39% two years ago.

The market shift has had monumental manufacturing implications. Making analogue inks is akin to mixing paints, with a comfortable margin for error during production. Life in the digital age is more exacting, as Boughton explains: "We're now down to ink pigment sizes of below 100 nanometres with our new pigment dispersion equipment – that's about the size of a human cell."

Precision is critical, with digital printers ejecting ink from more nozzles at a faster pace than analogue ancestors. Boughton says: "One of our demonstration printers on site drops 2.1 billion droplets of ink per second. That gives you an idea of how small the ink particulate has to be."

Quality is enshrined in a meticulous mixing process that combines automatic dosing controlled by touchscreen control panels. The site has also invested £500,000 in pigment dispersion kit: alongside the new digital facility, this has helped reduce the labour cost per kg by 40%. The new digital facility was entirely self-funded with full backing from the site's Japanese HQ. Tokyo has been bursting with pride ever since Broadstairs won a Best Factory Award in 2011.

The new facility's successful integration is as much about investment in people as in plant. Operators steeped in the analogue age have been digitally remastered through intensive training centred on multi-skilling. Analogue ink production hasn't been forgotten, though. Fujifilm is committed to being the last man standing in screen inks and RFT levels for analogue have soared to 94% from 78% in 2011, thanks to the application of digital production rigour. However, shopfloor stars now aspire to work in digital, not analogue production.

Operators can voice this desire through voluntary personal development plans. The scheme launched in 2012 and has fast-tracked 16 employees to an NVQ in Business Improvement Techniques. There's plenty of scope, too, for homework back at Broadstairs. Three cross-functional CI teams pursue kaizen, captained by two new full-time CI process specialists. Tactics are formulated in a new CI command centre.

Top initiatives so far include a five-week saving per year in preparation times after combining the RFID tagging and de-gassing of ink storage pouches, and a 50% improvement in line packing rates.

Faster packing has been something of a necessity as Fujifilm tries to keep pace with burgeoning international demand for its inks. Almost 85% of products go overseas, with rapid growth in China. The rise of consumerism in the country is creating hefty demand for inks that feature in everything from signage to shopping bag logos. Buyers all want inks 'made in the UK' – a badge of quality.

And with their deliberations over dispersing pigments to the nearest nanometre and commitment to workforce skills, the team at Broadstairs is more than living up to the billing. ■

TOP 3 POINTS

- Reinvented itself as a world-beating manufacturer of precision digital inks
- Launched a new £3m digital manufacturing plant in the busiest period without a dip in quality or delivery rates
- Shopfloor fanatical about improvement: 3,195 man-hours saved through kaizen projects

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Winner: Best Household & General Products Plant
Winner: Supply Chain Award

A plant to **bet your life** on

An adman in Mad Men might have come up with the line: 'Milliken, you can bet your life on it.' It would be a fittingly American turn of phrase for what is an archetypal American family business. It also has the ring of truth

Milliken is a US-owned business, founded in the 19th century and headquartered in South Carolina. Its real self-adopted catchphrase – which unarguably also has a flavour of Americana about it – is 'a strong sense of purpose to do good'. It may sound a little corny, but Milliken did, after all, set down its first recycling policy in 1900 and, today, can lay genuine claim to 'adding real value to people's lives'.

Far away from Spartanburg, in the textiles town of Bury in Lancashire, Milliken does just that. The Wellington plant, the core of which was built in the 1890s and bought by Milliken as its first European outpost in the 1960s, is now the home of Milliken European Airbag Products.

Combining traditional textile production with clever chemistry, the much modernised factory still echoes to the clatter of 100-plus

weaving looms, making the material from which its automotive supply chain customers across Europe, the US, China, Mexico, South Africa and Russia, fashion airbags that the rest of us do, indeed, bet our lives on every day.

Indeed, the plant is an exemplar of supply chain excellence that sees deliveries of raw materials organised for optimum product flow through the production process, and the use of kanbans and supermarkets to ensure products are only made as needed to keep inventory at the required levels.

Inventory value, days and turns are measured, recorded and tracked – the turns, for example, have doubled since 2007. On-time delivery currently stands at all but 100% and the perfect order measure is very nearly as high. These performances are displayed for everyone on the shopfloor to see.

Alongside much else; like the life-sized mannequin nicknamed Ian Dury (the clue is in the name when you slur it) who contributes more than window dressing to the plant's determination to 'add real value to people's lives and improve health and safety'. The dummy is re-dressed every week as a reminder of the risks to anyone block-headed enough to put at risk their own safety and mar a lost time and recordable incident rate of less than one, and a total incident rate of just six per 200,000 hours.

As well as being a worthy nominee for the Health & Safety Award and the winner of the Supply Chain Award, only a plant with all-round world-class performance gets to be selected for the Best Factory Award in its manufacturing sector. Milliken's modern day manifestation of a largely long-gone British textiles industry would make its antecedents especially proud.

Now, as then, it is the automation of complex processes that dominate the mill. The initial sizing which applies polyacrylic acid, making workable the raw, chemically produced warp yarn. The beaming that combines multiple section beams into loom beams. The weaving that converts the yarn to fabric. The scouring that removes the by now redundant size and yarn oils. The coating that enhances the product performance; 100% inspection and fault marking (although this is still done by an experienced human eye). Then the laser cutting to pattern, laboratory testing, warehousing and, finally, waste segregation and baling.

Who knows how many more weavers might have survived the international onslaught on their industry in the first half of the 20th century had they been able to boast productivity that outstripped tough metres-per-man-hour targets in each of the last five years. Or increasingly exceeded world-class overall equipment effectiveness (OEE) performance. ■

TOP 3 POINTS

- Productivity targets of metres-per-man-hour have been beaten every year for five years
- An exemplar of supply chain excellence, with kanbans and supermarkets keeping inventory levels to the minimum
- The site achieves world-class OEE standards

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Bosch Thermotechnology

Winner: Best Engineering Plant
Winner: Health & Safety Award
Highly Commended: Innovation Award
Highly Commended: Energy & Environment Award

Hot on customer service

A lot of manufacturing managers proudly boast that their plants are world class, customer focused, innovative and make products of the highest quality. Not so many come up with such ample proof of these hard-won attributes

It is to their credit that Bosch Thermotechnology's manufacturing director Bob Murdoch and business excellence manager Andrew Bentley ask for a little time to answer the question: 'What makes your plant great?'

They decide on a long sentence that nevertheless sets out who they are and what they do. "As the UK's leading manufacturer of domestic heating and hot water technologies, with a world-class manufacturing strategy to deliver an unrivalled customer focus, the Worcester plant continues to deliver exceptional levels of product quality, customer satisfaction and innovation."

Or, to put it simply: they make top quality hot water boilers that customers like. And they do it very efficiently.

But that is to ignore other high

performance achievements that shine out when the plant is scrutinised on areas such as health and safety, its environmental credentials, people and skills development, supply chain prowess and self improvement.

Worcester Bosch, as it is generally known, is the UK's number one supplier in its market – a position it puts down to a business strategy that defines customer focus as its undisputed number one priority.

The site has been on its continuous improvement journey for 15 years. It was the pilot for the Toyota-based Bosch Production System and now, as the first in the worldwide, 23-factory-strong Bosch Thermotechnology group to introduce lean line assembly, is that group's manufacturing centre of competence.

It showed the Best Factory judges its plans as far ahead as 2017 to further develop lean assembly lines and to increase flexibility that already allows working hours in the factory to be quickly adjusted from a 30-hour to 48-hour week. The plant operates to the credo, 'We only manufacture boilers that we've sold'.

Customers are encouraged to visit the factory, talk to the shopfloor employees – who Bosch prefers to call associates – and are able to see "that the product they are buying is made in the UK".

Focused on quality ("with the Bosch name, you have to be"), Worcester has not only won internal quality awards but all its products are *Which?* magazine best buys.

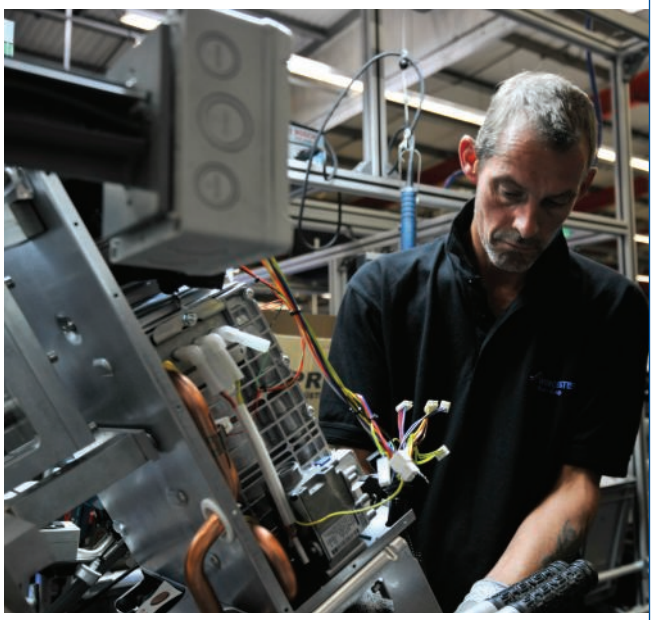
Process innovation also features prominently. For example, the production process includes friction stir welding, developed by Bosch working alongside the process licence holders, the Welding Institute. Worcester Bosch is the first plant in the UK to use it for serial production.

Customers enjoy same- or next-day delivery, while service vehicles are replenished overnight with fresh supplies of the spares used the previous day; parts orders placed by 5pm are received by 10am the next morning.

Further up the supply chain, Worcester Bosch operates a development programme with suppliers based in the UK, Europe and low-cost countries such as China. They are all involved in the factory's pull strategy

TOP 3 POINTS

- A world-class manufacturing strategy built on flexibility and lean assembly lines
- Unrivalled customer focus that encourages factory visits and delivers one-day lead times
- Exceptional product quality, evidenced by internal and external accolades



that responds to signals from customers into the manufacturing plant and on into the supply chain.

'Customers' and associates inside the plant are also important. In the health and safety arena, this site is again best of breed within Bosch Thermotechnology. Worcester is not a high-risk plant but does have more equipment and more complexities than most, and prefers to follow procedures that "give associates the ownership of their own health and safety".

Its people management and skills development credentials are underlined by its training, currently, of 49 apprentices, a graduate programme featuring scholarships and funding, and a well-managed competency framework that identifies strengths and areas for improvement.

It is proud of its strong links with local schools and the Young Enterprise scheme.

Social responsibility also extends to environmental concerns that have seen the plant, which was set a target of achieving a 15% reduction in carbon emissions between 2007 and 2012, again outperform its Bosch companion plants by registering a 23% reduction. It also sends nothing to landfill and its products are 100% recyclable. ■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EMS Radio Fire & Security Systems

Highly Commended: Best SME
Highly Commended: Health & Safety Award

Alarmingly good

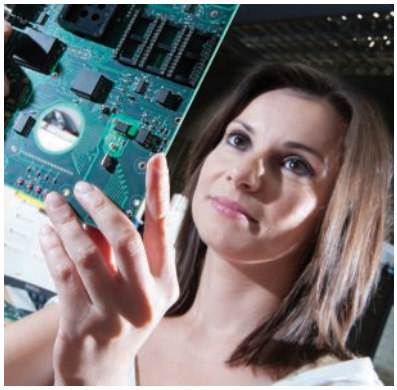
Tumbling lead times, innovative product ventures and a shopfloor passion for PDCA have put this SME head and shoulders above its larger rivals

A slingshot isn't the only way to take on Goliath. An arsenal of manufacturing agility, innovation and adaptability keep light-footed EMS Radio Fire & Security Systems dancing around its bigger rivals.

The Herne Bay factory combines a core expertise in wireless fire alarm systems with contract manufacture of products ranging from printed circuit boards to laser telemetry systems for avionics.

In its staple alarm system market, EMS locks horns with multiple global giants. All have deep pockets to throw at product development, marketing and new plant.

The pendulum has swung even further towards the big guns since EMS's last BFA finals appearance in 2010. All alarm systems face mandatory accreditation to European safety standards, which cost around £500,000 to introduce. EMS has pushed ahead with compliance across its product



range. Certification is an investment rather than an expense, says operations director Chris Mulvihill. "The only way we can begin to compete is to show we are at least as legitimate as them and, on a product and application level, maybe better."

EMS's key advantage is in the clever stuff – the wireless radio frequency (RF) that connects multiple alarms. EMS is about to produce a new RF system for an OEM. Mulvihill explains: "It's one of the strategic moves we planned. We're a company of a certain size; we have limited financial might. The best way for us to propagate our products is to work with third parties." The OEM will market the alarm on the strength of EMS's much sought-after RF.

The joint venture into premium fire detection products, where systems can retail for £100,000, will be complemented by a solo bid to boost sales in the conventional market. The Herne Bay site is set to launch a new product range next year.

Success in both ventures is underpinned by a first-rate factory. Since 2010, inventory has dropped 19% and lead times from one week to 2-3 days. And speed matters in this market. A fire detection system is often an afterthought for architects, so eleventh-hour calls are not unusual.

The factory has an exemplary health and safety record, with the last lost-time accident in 2009.

EMS has long had a foundation of 5S, kanban and one-piece flow. But its two new CI signings have set the factory apart this year. A plan-do-check-act initiative has stolen the hearts of the site's 80-strong shopfloor and helped identify £250,000 in savings. Operators almost leap out of their chairs to tell you about the latest PDCA-enacted improvement idea.

The second hit has been a lineside stocking system, introduced after managers spotted it during a tour of another BFA-winning site. Positioning more materials by work areas instead of in a central store has reduced WIP by 52%.

The factory is segmented into cells for fire detection systems and a PCB build area. Innovation is everywhere: laser-guided lights direct employees to place components in the precise spot, and employees are multi-skilled to allow interchange between cells.

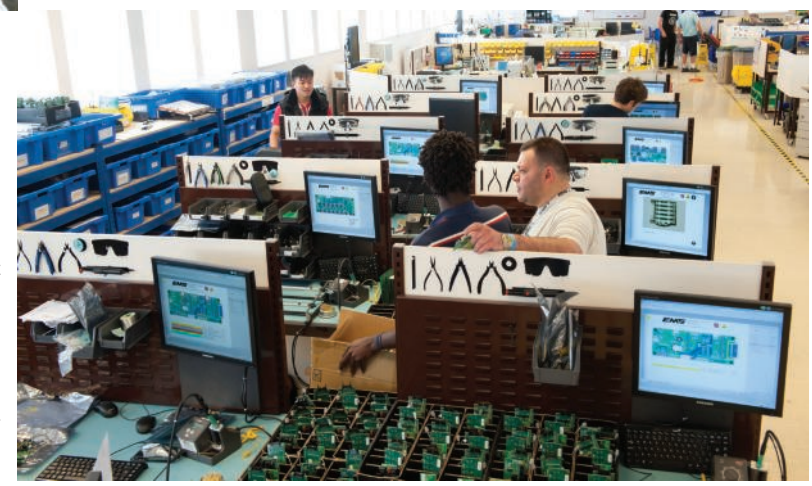
It's a triumph of dynamic manufacturing masterminded by a bespoke IT system known as DMC. The system gives live updates on customer orders and uses poke yoke in conjunction with barcode tracking.

Little wonder, then, that the shopfloor is a key sales tool. "I bring customers in as often as I can," says Mulvihill. "They make their own mind up from there."

EMS has now started on the electronics and product assembly for automated cash management technology from Cash Bases, which is then deployed by supermarket giant Tesco. This is one SME that's not afraid to think big. ■

TOP 3 POINTS

- Develops market-leading systems – both own brand and JVs – and contract manufactures everything from PCBs to avionics
- Winning business through outstanding product quality and lightning-fast lead times
- PDCA-powered CI has fuelled operational savings in excess of £250,000



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Cummins Power Generation UK

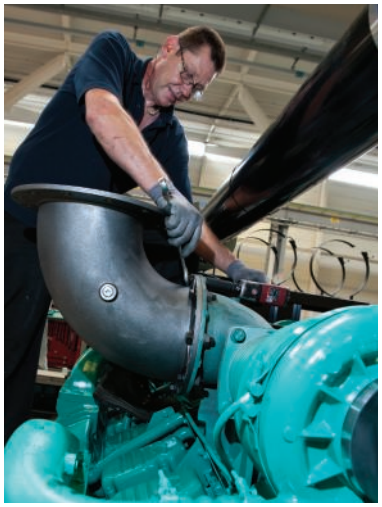
Winner: Export Award
Winner: Most Improved Plant

Staying power

Power generation as part of Cummins Inc represents 16% of revenue generated by five global sites. The only plant in Europe is at Manston, Kent. And quite a plant it is

At the start of every year, the plant manager at the Manston, Kent site of Cummins Power Generation sets out a single-page list of goals. It's an important moment in defining the 12 months ahead. In 2013, the list was headed by further development of the company's safety culture. This was followed by a number of challenging targets, which included the reduction of conversion costs per standard hour, along with improved inventory turns, quality and on-time delivery (OTD), to name but a few. The onus then falls on the management team and workforce to implement, deliver and review these ambitions.

Needless to say, this year the company is performing well. For instance, both



productivity and on-time delivery have been edging upwards – in fact, the latter has now hit 100%. Furthermore, a safety T-card system that engages employees in documenting safety improvement ideas and issues has led to a new culture and zero incidents.

The manufacturing of power generation equipment at Manston is continuing its unerring march towards the automotive benchmark. For instance, work instructions are now not only standardised, they are electronic and available to access at workstation touchscreens – a move that has helped drive improvements in first-time passes at test.

Ultimately, the site is aiming to boost its revenue using a number of manufacturing strategy projects through to 2015. These include ongoing standardisation and integration of records into EASE manufacturing document manager software. Here, reviewing any gaps in the manufacturing records will create targets for improvement in achieving 'standard work'. The first phase of this process has already been completed in the plant's HHP lean burn generator area, where the layout has changed from the previous bay build process to a new multi-stage flow line. A second stage project has now commenced to further improve line velocity and increase capacity.

The company is also implementing a transformation vision for its supply chain. Cummins Power Generation UK exports almost all of its products, with the Middle East, China and Australia among the prime destinations. The key strategies to manage its market-focused supply chains include the implementation of forward positioning for finished goods to enable immediate product availability. Furthermore, key products are being dual sourced to respond effectively to unplanned demand, while component kitting and product knock-down is being used to deliver the lowest total landed cost. Added to the fact that the team supports 97% of customers in their own language, this is clearly a company with a vested interest in optimising its overseas trade operations. As a consequence, it becomes a worthy winner of this year's Export Award.

TOP 3 POINTS

- On-time delivery now at 100%
- Bay build processes being replaced with multi-stage flow lines
- 19 languages accommodated in the plant's customer support function

Achievements of this ilk require the engagement of the entire workforce and here Cummins Power Generation excels. Among the initiatives in 2013 is an employee engagement survey, the launch of manager training sessions, the ROAR (recruit, onboard, advise, retain) affinity support group for new starters, and an increase in graduate placements as part of the company's hire-to-develop strategy.

All professional employees have a workplan which is managed through an online system, with individual strengths, development areas and likely next roles reviewed regularly. From an operator perspective, new starters get two weeks' training before being buddied with a competent person and subsequently working their way through a training matrix and gaining NVQ certification.

The result of this intensive people investment is an overall improvement in plant PPM – in fact, the site secured the group chairman's 2012 quality award as a result of its endeavours.

There's no doubting that this plant has made huge strides in recent times, showing improvements in shopfloor productivity, on-time deliveries, customer delivered quality and lead times. Ultimately then, a deserved recipient of this year's Most Improved Plant Award. ■

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Quinn Glass
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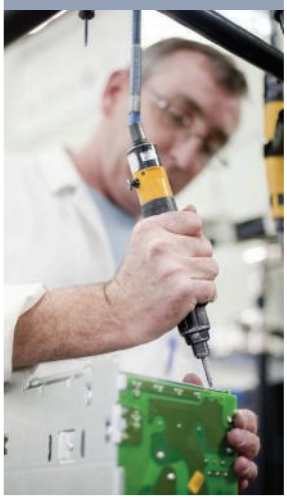
Siemens
Siemens' Congleton site, which manufactures over 500,000 electronic drives per year, is regarded as a jewel in the crown by the manufacturing giant.



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Eaton Production International

Winner: Energy & Environment Award
Highly Commended: Best Electronics & Electrical Plant

Switched-on performance

As part of a $21 billion, 115,000-employee global enterprise, Worksop-based Eaton Production International knows it has to perform. And it certainly does

Dedicated to the manufacturing of switch disconnectors and rotary cam switches used by machine builders, the Eaton site at Worksop produces around 1 million of each basic switch type every year, although around 17,000 live products are available.

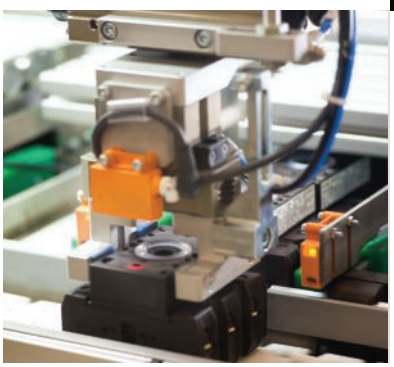
Lead times here are short, typically 1-4 days from receipt of order. As a result, production must be quick, flexible and cost effective, without any detriment to the company's high quality standards. Orders are downloaded into SAP, from where capacity planning and MRP lead to the generation of production orders. Each PO features a barcode and all operations are recorded against takt times of 30-80 seconds. SAP calculates efficiencies against standard times, with performance fed back to individual operators. This data helps plan overall cell efficiencies.

The lean journey at Worksop commenced four years ago when Eaton acquired the Moeller Group. As a result, the plant now uses a well-defined leadership model linked to overall business objectives such as growing turnover by 6% year on year through to 2017. Known as APEX (Achieving Performance EXcellence), the model starts with the setting of directions and plans. Organisation and alignment comes via role models and team empowerment, while performance analysis arrives by way of development, reward and recognition, which in turn motivates employees to continuously learn and improve.

The plant sets annual cost-out targets, which this year sits at £300,000 – the site is currently on-target, mostly achieved via ELSS (Eaton Lean Six Sigma) and direct material savings. ELSS is also helping to drive OTD, which currently stands at 98%.

CI activities are abundant. For instance, Worksop held its first value analysis/value engineering event earlier this year. Focusing on its highest volume assembly line, the company established a cross-functional team of 23. Collectively, through walking the process and brainstorming, 84 ideas for improvement were identified, nine of which were selected and approved with projected savings of £168,000. There is also an employee suggestion scheme with quarterly merit and financial awards.

Manufacturing emphasis is very much focused in-house. The Worksop facility features a 28-machine mould shop (including twin-shot technology), press shop, toolroom, assembly shop, test, packing and despatch. The mould shop is potentially a bottleneck, but much has been done to alleviate this by introducing robot-assisted machinery, TPM and set-up time reduction events. For example, a recent project to re-route die waterways saved 19 minutes per set-up.



Significant improvements are also evident in the press shop where a self-defined electronic decision system, called E-Kanban, has replaced T-cards. The new system monitors current kanban stock levels while providing information such as expected tool requirements, material shortages and planned run time dates displayed via two 55-inch industrial display monitors.

Eaton Production International has around 200 employees serving 13 years on average. The factory workforce is multi-skilled with training matrices in place for each department. What's more, 45 have now completed NVQ Level 2 in BIT. True flexible working patterns are deployed where full time workers can flex by up to +/-36 hours to suit requirements. This flexibility works both ways, to suit worker and company. As a result, there is no temporary labour on site.

Another area in which Eaton Production excels is all things green. ISO 14001 accredited, the site is well on target to reduce the waste disposal recorded last year – waste has been declining for the past four years. Scrap rates are also reducing, with specific materials such as brass and copper segregated for recycling. Furthermore, energy costs are down on 2012 thanks to a number of ongoing projects relating to process chilling, moulding, pipe lagging and variable speed compressors. In fact, Eaton is shortly to introduce automated power energy monitoring.

Ultimately then, not just a Highly Commended in this year's Best Electronics & Electrical Plant Award, but a deserved winner of the Energy & Environment Award. ■

TOP 3 POINTS

- CI driven throughout the factory against annual cost-out targets
- Flexible working arrangements mean no temporary labour on site
- Huge emphasis on reducing energy consumption and waste

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Winner: People & Skills Development Award
Highly Commended: Best Electronics & Electrical Plant

Performance in overdrive

Forget the management speak – people really can be your best asset, as proved by all-conquering variable speed drive manufacturer Siemens of Congleton

All the cliché-wielding David Brents of the business world should be sent on a tour of Siemens, Congleton. This manufacturer of variable speed drives – used in everything from air-con units to airport baggage handling systems – shows precisely what the 'we value our people' mantra can achieve when it's more than management trite.

Nearly 90% of employees have had an improvement idea implemented under the site's suggestion scheme this year. Shopfloor workers, for example, have boosted line efficiency by going all 'Grand Designs' and giving workbenches a makeover to improve ergonomics.

Even the most junior team members are chipping in. Apprentices start out in a custom-built Junior Factory, where they must build a fan assembly for a drive unit for less than the price being paid to the current Chinese supplier.

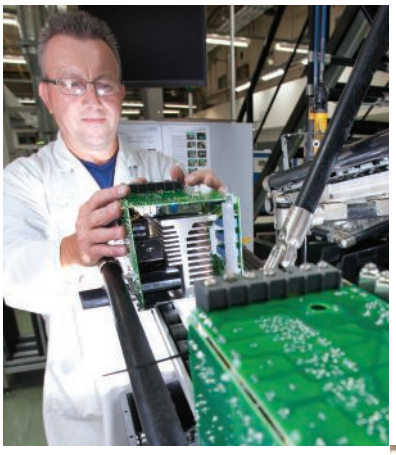
There's no idea too far out of left field for the Siemens management team, providing it can prove itself against the site's hallowed 2015 strategy – anchored on improving quality, cost and delivery, says Finbarr Dowling, managing director at Congleton.

The strategy was forged during the "dark" recession-hit days of 2009. One of Dowling's first jobs was to stave off the administrators at many of the factory's UK suppliers. Customers had also suffered from holding high levels of stock when the crash hit.

"Nobody was ever going to be caught out again like that," says Dowling. "Our customers were going to become much choosier: now, they'd want to hold less stock and get products faster."

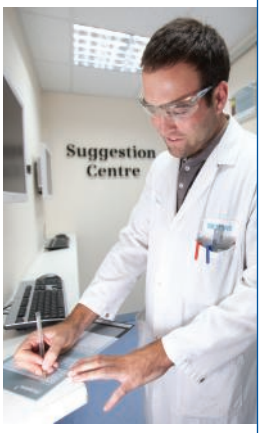
The 2015 blueprint provides Congleton's riposte. A huge wall chart depicts eight strategic themes, which branch off from the core goals of quality, cost and delivery like moons orbiting the planets. Under titles like 'be super fast to market' are the actions, with a named employee responsible for ensuring delivery.

And this isn't an isolated management mural. Shopfloor teams perform daily debriefs around whiteboards etched from the same strategic stone. The focus has worked: current delivery performance is 98.5% compared to 85% in 2011; first pass yield is 99.55% on units; and productivity (savings) as a percentage of value added costs are running at 8% versus 5.5% in 2011.



All powered by indefatigable teamwork. Groups of employees from all backgrounds have been seconded to special 'obeya rooms' where they're handed a product, a pack of marker pens and a mandate to find a better way. Dowling says: "Obeya is Japanese for war room: it's not strategic, more tactical. The strategy is to win the war. The obeya room is about winning the individual battles." Budding Napoleons have helped to cut some product costs by 40% and one obeya session came up with 260 improvement ideas for a single product.

Outside the obeya sessions, the shopfloor can submit eureka moments via a dedicated suggestion scheme centre using email or old-fashioned pen and paper. Star ideas bring cash prizes and public recognition. The site also runs a champions scheme to celebrate outstanding individual behaviours, such as taking on extra responsibility. A recent winner had the courage to stop the line because of quality concerns.



At Congleton, power is firmly in the hands of the people. Operators are entrusted to redesign work areas with the support of finance and procurement experts. Employees must pitch their plans to Dowling and his management team. "Without fail they've saved 50% in space, they've measured all the waste – the muda – how far they have to walk and materials handling."

Designs are mocked up with cardboard and sticky tape, with successful bids trialled in plastic before turning permanent. "Every time I come away from these pitches, I think how lucky I am to work with these people," enthuses Dowling.

And with the plant boss leading Congleton to commercial success and critical acclaim after the dark days of 2009, the feeling will be very much mutual. ■

TOP 3 POINTS

- Eats, sleeps and breathes strategic goals of improved quality, cost and delivery
- Outstanding employee engagement: 86% have submitted and implemented an improvement idea via the suggestion scheme
- Launching an apprentice-led Junior Factory scheme to in-source components

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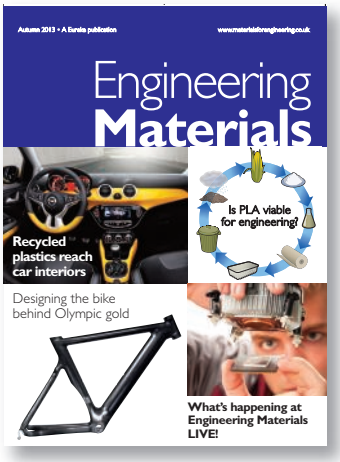

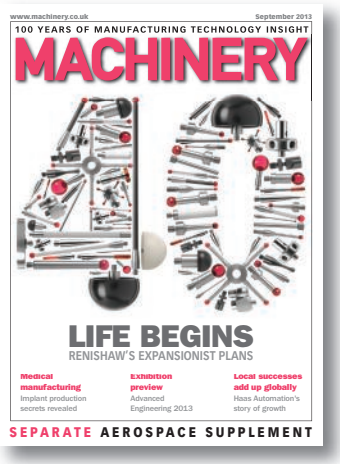

Passionate about engineering

Tharsus Group

Winner: Best SME

Original **thinking**

In just 10 years, Tharsus has evolved from a £1 million 'metal basher' into an £11 million pioneer in a service known as OEDM. Intrigued? You should be

Blyth-based Tharsus Group is the epitome of 'evolve or die'. In less than a decade, the company has become unrecognisable from the conventional metal-based engineering subcontractor of its previous incarnation. After a successful escapade in manufacturing cable management equipment, that particular world "stopped turning" in the 2009 global downturn, leaving the company to once more rethink its strategy. In a moment of inspiration, the company decided to start offering its considerable in-house skill set as a new contract-based niche service known as original equipment design and manufacturing (OEDM). Five years on, and the success of OEDM has been meteoric.

With 150 employees and a management team drawn from the automotive and FMCG sectors, this privately-owned business takes

the strain of design, development and manufacturing on behalf of its brand name customers. The company says it is more cost effective than the alternative of using separate design houses, test houses, certification bodies and contract manufacturers. Crucially, customers retain the IP to the solutions provided by Tharsus.

Accommodating annual product volumes from 50 to 5,000, among the concepts recently transformed into fully resolved solutions include some that entail hydrogen generation, aqueous parts washing, wind power, electrical vehicle charging, localised energy storage and flow battery technology, to name but a few.

There are many benefits of working with an OEDM business. Aside from the 'true partnership' ethos, these include: fixed unit cost – not fixed overhead; collaborative design, which is proven to improve the product; the availability of production bandwidth; and the ability to leverage an existing supply base. OEDM relies on a strong, collaborative supply chain and Tharsus has reduced its number of suppliers by 27% in recent years based on best overall value and performance.

The OEDM formula is certainly working. Aside from 20% year-on-year growth, in 2008 exports were less than 5% of business, whereas now they are more than 40%.

The company's balance sheet success is underpinned by extensive manufacturing improvements. When Tharsus acquired its Blyth factory, it was an empty, vandalised shell. Today it is a sparkling reflection of the fruits generated by best practice methodologies such as lean and Six Sigma. Around 100 suggestions for improvements were implemented last year alone.

Adopting a flexible, cellular approach, electrical test is the only 'hard point' at Blyth – everything else can be relocated as required on wheels. FlowTube-based assembly stations have been defined with huge input from each cell, bringing ownership and pride to the shopfloor.

Previously, workflow through cells was not evident, but CI activities in assembly have led to better floor space utilisation and increased output. Typically, cells now offer some 20-30% increased capacity, chiefly through reduced build times. Certain assembly cells went from three-lane configuration with a bottleneck at test, to

single lane assembly with five test stations. Similarly, despatch layout has been reorganised to accommodate one-piece flow.

SOPs and product traceability have also been introduced, while kanban systems now exist for parts at workstations (vendor managed) along with a pull system between the three Tharsus sites. The business employs KPIs across all major functions.

Tharsus has a core of permanent employees, with others on three-month rolling contracts, and some agency staff. A weekly meeting between manufacturing and sales helps dictate labour planning, while the company's recently installed Insight 123 MRP is run daily.

Operators here are graded (three levels) for skills via an engagement and development programme that includes skills matrices for each cell – skills flexibility is now around 70%. There are quarterly performance reviews, annual appraisals and an employee engagement survey. There is even lunch with the CEO, Brian Palmer, for all new starters so they can share his enthusiasm and vision: he might now be tempted to mention that his company has just outshone the competition to win Best SME at the Best Factory Awards 2013. ■

TOP 3 POINTS

- Innovative OEDM business model is driving growth and prosperity
- Flexible manufacturing cells offer 20-30% increased capacity
- Skills matrices for each cell have already led to 70% skills flexibility across manufacturing operations

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Tata Global Beverages

Winner: Judges' Special Award
Highly Commended: Best Household & General Products Plant
Highly Commended: People & Skills Development Award

In the bag

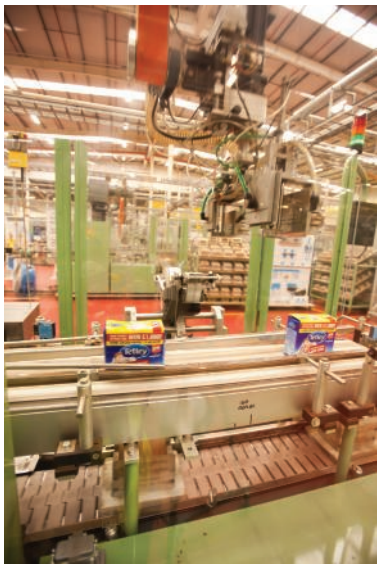
The nation's largest producer of teabags is the Eaglescliffe plant of Tata Global Beverages, from where its famous Tetley brand commands an impressive 28% of the UK market

As we all know, Tetley make teabags make tea. However, the way it's done at Eaglescliffe is mightily impressive. The site produces a staggering 280 million teabags a week for 254 customers that include all of the major UK supermarkets. What's more, the direct cost per tonne at Eaglescliffe is cheapest in the group, which includes sites in India, Poland, the Czech Republic and Russia.

How so? Well, speed and labour content are the chief differentiating factors here, and they have to be: day one orders are typically for day three delivery. As a result, Tata Global Beverages rightly considers itself "an engineering function that makes teabags".

As might be expected, high degrees of automation are prevalent throughout the 370-employee plant, underpinned by significant capital investment. With so much technology, the site operates a programme of maintenance excellence. Condition-based monitoring is deployed using techniques such as thermal imaging, along with 125-point weekly machine checks. Just seven years ago, planned maintenance completion stood at 40%, now it is 90-95%, a result that has pushed up availability and OEE, and helped reduce costs.

Teabag manufacturing and packaging (into softpacks or cartons) is extremely slick at Eaglescliffe, but first the tea needs to be blended. Again, this is an automated, conveyorised process comprising sack loading, screening, bailing and sack slitting, before weigh stations see the tea enter silo farms. From here, it is subject to automatic weigh pans and vibrating pans before being blended.



Moving into the carton production hall, 76-teabag boxes come off the line every two seconds. If that seems impressive, softpack manufacturing is even more so. Around 80% of plant volume takes place in this 24/5 area, where the lines produce 240-teabag packs at a rate of 33 per minute. The past seven years have also seen the introduction of robot cells for palletisation.

Not that CI is exclusively technology based: at operator level there are balanced scorecards with key metrics. CI is a way of life here and Tata Global Beverages encourages its people to drive improvements. For example, just two years ago, changeover reduction (tea-to-tea) stood at two hours, but through a series of activities requiring operator engagement, this is now 25 minutes.

In terms of empowerment and development, the site uses Hoshin Kanri, a methodology similar to kaizen that uses several tools to build a CI 'house'. These include a PDCA improvement cycle, 5S and standardised work instruction, structured and practical problem solving, value stream and process mapping, visual management, TPM, SMED, poke yoke, lean measurements such as OTIF and OEE, and management control and reporting systems. The ultimate goal of the CI house is to deliver self-generating and fully operational teams – and, of course, savings.

Using Hoshin, the vision is to be the best FMCG factory in the UK, delivered using seven strategies. The results to date include: reducing the manufacturing cost base by 10%; cutting the logistics cost base by 11%; increasing output per direct employee by a factor of 2.3; and increasing softpack and carton OEE to more than 85%. Other achievements include increasing the number of training days per employee from five (five years ago) to 27 on average today – some 95% have now attained NVQ Level 2 in Business Improvement Techniques.

Multi-skilling is another key training initiative. In softpack, for example, 100% of operators are competent on every machine. Training manuals are currently being prepared for every asset at Eaglescliffe, which will result in a consistent approach to development.

Such endeavours mean Tata Global Beverages bags a Highly Commended in People & Skills Development to add to another in the Best Household & General Products Plant category – all topped off by winning this year's Judges' Special Award. Deserved recognition for the home of tea and Tetley Tea Folk. ■

TOP 3 POINTS

- Hoshin Kanri strategy used to train and empower people through CI
- Impressive reductions in both manufacturing and logistics cost base
- Maintenance excellence programme deployed to maximise uptime

DS Smith Packaging

Highly Commended: Best Household & General Products Plant
Highly Commended: Supply Chain Award

Packaged benefits

Producing 140 million boxes a year, there's no room for slack performance at the UK's undisputed leader in corrugated packaging

As a company, DS Smith Packaging is number one in the UK for corrugated packaging with a 33% share, while as a site Livingston is the single largest corrugated packaging facility in Scotland. So what's driving this success? Well, the branded spirits market represents a major opportunity in the locality, growing at circa 15% per annum, largely due to increased consumption in the BRIC nations. Another major driver is market demand for point-of-purchase packaging. However, DS Smith doesn't just design and manufacture these retail-ready packages, it collects the empties from the supermarkets and sends them to its own recycling plants, making the material ready for use again within days.

Site capability, price and innovation are the Livingston plant's USPs. The latter is now key to improving the whole supply chain through to customer delivery. For instance, for a well-known cereal manufacturer DS Smith came up with a thinner, lighter design of corrugated flute that saved space without any detriment to strength. In total, 911 pallets or 24 full loads per annum were saved, along with 22 tonnes of CO_2 emissions.

Good design, such as changes to box geometry or fibre content, is proven to save on lorries, pallet movements and warehouse space – all of which are enormously beneficial to the supply chain. This is just as well because the production and logistics operation here needs to be slick. For example, if DS Smith Packaging receives an MRP plan from a customer on a Wednesday, it's generally for delivery on Friday – no one wants stock in the supply chain.

From a production perspective, capacity balancing as part of site S&OP is an important management tool. Recent improvements in this area have optimised working capital and boosted OTIF, not to mention reduced paper stocks considerably. Furthermore, regarding the age profile of paper stock, previous two-week stock turns are now reduced to just four days.

In total, 129 of the 175 employees at Livingston are involved in the manufacturing process over a 24/5 operation. The company's colossal corrugating line features two knives so that two case types can be run simultaneously. The corrugator can also accommodate multiple flute profiles and paper grades, and is pre-print compatible. An Escada Syncro system allows complete process control, office communications and traceability.

Between the corrugator and the converting machines sits an impressive Dücker automated WIP system. This £3m investment has increased capacity by 30%, while recently introduced RFID technology is also used to aid material accountability throughout the production journey.

From a conversion perspective, the site operates 10 machines including two Bobst flatbed die cutters installed last year at a cost of £480,000. However, pride of place in this area will soon go to a new £4.8mBobst six-colour (plus varnish), flatbed die cutter that is currently being commissioned ready to commence production in October. One of only seven in the world, it is the first such machine in the UK.

But it's not all about the technology. In a 2012 employee survey conducted by a third party, the top three most favourably scored categories were health and safety, leadership and engagement. The latter is evident by way of the culture of CI instilled throughout the Livingston site. Of 1,003 suggestions for improvement put forward last year, 517 were implemented. Furthermore, the company works closely with the University of Strathclyde to design tailored lean Six Sigma courses that involve students having to generate at least £2,000 worth of savings as a result of project work.

Unsurprisingly, DS Smith Packaging has secured several industry awards in recent years, and now it has two more richly deserved accolades to swell the trophy cabinet at Livingston: Highly Commended in both Best Household & General Products Plant, and the Supply Chain Award. ■

TOP 3 POINTS

- Innovation drives cost and environmental benefits across the supply chain
- Automated WIP system has boosted capacity by 30%
- Leading technology deployed includes the UK's first six-colour die cutter of its type

Autoglym

Highly Commended: Judges' Special Award

Rise and **shine**

Autoglym is on a mission to make the world's most successful vehicle care products – and judging by progress to date, its journey is well advanced

Because so many people love their cars, vehicle care is big business. Letchworth-based Autoglym is certainly capitalising by today manufacturing over 100 cleaning, polishing and protection products for the car enthusiast. Moreover, there are a further 20 new products currently in development.

Demand is clearly strong, which means manufacturing operations must be equally robust. A step change in production at Autoglym arrived in 2006, when increasing orders meant the company was faced with introducing a night shift or scaling-up the plant. The shrewd management team chose the latter. Ever since, there has been huge progress in areas such as aqueous production, which now offers four times more capacity than 2006, blending over 1 million litres of product every month. The investment totalled around £500,000 but achieved ROI within 12 months.

On a similar theme of improvement, the filling, capping and labelling of volume retail products now takes place on the company's automated 'Super' line, which commenced operations in 2011. All 48 retail products, in four different bottle sizes and with two different closure types, are produced in batches of around 15,000 on a single line with vision-enabled technology to ensure quality control.

Previously there were three retail product lines, each of which would be down twice a day to allow 30-minute changeovers. Due to a level of redundancy built into the new single line configuration, around four hours' downtime per day has been saved. At the end of the line is the most recent Autoglym investment, an automated case packer capable of packing 400 bottles a minute.

Despite the many improvements, there is no complacency here. As part of its manufacturing strategy, the management team has identified a range of gross margin projects designed to further improve operations. Some have already produced savings of circa £45,000, and the company currently has around 100 such projects in progress. Important business objectives will be driven by a number of key imperatives and 'must do's' that include further improvements in stock reduction, planning, forecasting, efficiency, customer service and more. A dedicated CI team is deployed to manage and monitor the projects.

From a planning perspective, the company takes sales order processing data into its Oracle JD Edwards software system. MRP runs daily, with production plans and works orders generated by line/area to meet the required date. There are production team briefings at 07:30 every morning.

Interestingly, there are no team leaders at Autoglym. Instead, using skills matrices, the company looks to multi-skill its technician-level staff so they can work anywhere in the factory. The most trained worker is now 83% competent across all disciplines – two years ago this would have been closer to 20%.

The skills matrix is linked to a structured pay matrix. There is also a good pension scheme, free-issue shares and monthly dividends. There are annual appraisals, paid lunchtimes and Christmas bonuses. Autoglym has been in *The Sunday Times* list of the UK's 'Best 100 Companies to Work For' for the past eight years.

In return, the workers display an exemplary can-do attitude which helps the company meet demanding monthly performance targets. Measures include cost of sales, scrap, overheads, customer service, staff absence and housekeeping. Autoglym also produces a monthly working capital report focusing on inventory, including raw materials.

The company has come a long way since its origins in 1965, today employing 130 people and exporting to 40 global markets.

Its products are endorsed by almost every major car manufacturer and 15 racing teams. The company even has two Royal Warrants of Appointment that see its products used on vehicles serving HM The Queen and HRH Prince of Wales.

Autoglym product labels say 'Reflecting the best of British'. Absolutely – a worthy Highly Commended in this year's Judges' Special Award. ■

TOP 3 POINTS

- Huge advances in all production areas, focusing on automation and efficiency
- Dedicated CI team driving improvement projects
- Multi-skilled staff deployed to serve all factory areas

Herman Miller

Highly Commended: Judges' Special Award

Sitting pretty

Shipping £90 million of goods every year from its Chippenham facility puts Herman Miller in the premier league of office furniture manufacturers

Seating is the core manufactured product at Herman Miller's Chippenham factory. However, these are no ordinary office chairs. High-end models such as Aeron, Mirra and Sayl are desired by blue chip customers in industries such as banking, accountancy, automotive and petroleum, to name but a few. What's more, they carry a 12-year warranty, which means quality is a prerequisite, along with productivity and cost.

'Task' chairs – chairs designed to be used continuously – are produced on a single piece, 15-stage flow line, where they are assembled to order on typical takt times of 45-65 seconds. There are four different task chair models, although changeover time is only 30 seconds. Herman Miller uses an 80:20 (permanent-temporary percentage) labour flexibility mix to address fluctuations in customer demand.

Chairs are typically made today for delivery tomorrow – no inventory is held of finished products. Infor Syteline ERP (recently upgraded) allows Herman Miller to monitor customer demand, schedule delivery dates and track resources, while a bespoke electronic platform called MySign permits suppliers to see demand in real time, confirm delivery and provide shipment tracking.

The entire manufacturing ethos centres on HMPS (Herman Miller Performance System), which was introduced in the late 90s to eliminate difficulty, eradicate waste and strive for perfection. Loosely based on the Toyota Production System, it embraces a whole suite of technical tools, philosophies and management systems. For instance, philosophies include: customers first; people are the most valuable resource; and kaizen is a way of life.

Before HMPS, the company had kaizen events, but now it seeks improvements every minute of every day. Time is allocated so that facilitators/leads can address issues and drive change. Herman Miller has a lead-operator ratio of 8:1 as it believes this best supports CI, and leads spend around 80% of their time engaged in CI activities. The remainder is spent filling in for absence, covering breaks or helping out if operators fall behind, for example. HMPS uses a structured method for implementing improvements that typically entails problem investigation and root cause investigation before applying a PDCA (plan, do, check, act) counter measure.

The company's FMDS (floor management development system) is the vehicle deployed for monitoring and driving metrics-related activities. Five metrics/KPIs are recorded, daily, weekly and monthly: safety, quality, cost, performance and HR development. Essentially, FMDS asks, are you on target and, if not, what activity is in place to correct the situation?

Training here is intensive, but it is undertaken to meet a skills matrix based on business needs, not simply to train everyone. A recently introduced HMPS training programme includes a one-day introduction, a five-day boot camp and a 12-week bridge programme. As a result, Herman Miller is starting to see daily changes for the better and a more scientific approach to problem solving. There is also Kata coaching (a Japanese teaching/learning technique) and job instruction training.

Many generic factory measures have improved at Herman Miller over the course of the past decade, notably reliability (OTIF) which now stands at 99.4%, and PPM (faults per item shipped, scaled up to a million), which is now less than 0.1%. What's more, in 2013, the company is looking to drive $650,000 out of its total material costs, as well as a 10% improvement in units per labour hour.

The future is certainly bright for Herman Miller. In 2014, the company will merge its existing three sites into a single, £13 million, 176,000 sq ft facility at nearby Melksham, where it will continue to make seating fit for a king – or, indeed, God. In an episode of The Simpsons called 'Thank God, It's Doomsday', Homer Simpson is transported to heaven after he correctly predicts the date and time of the apocalypse. He meets God, who just happens to be sitting in one of Herman Miller's Aeron chairs. ■

TOP 3 POINTS

- Uses its own manufacturing ethos, based on TPS, to drive best practice
- Deploys leads/facilitators to manage and drive CI
- Relocating to new £13 million facility next year across manufacturing operations

Vi-Spring

Highly Commended: Judges' Special Award

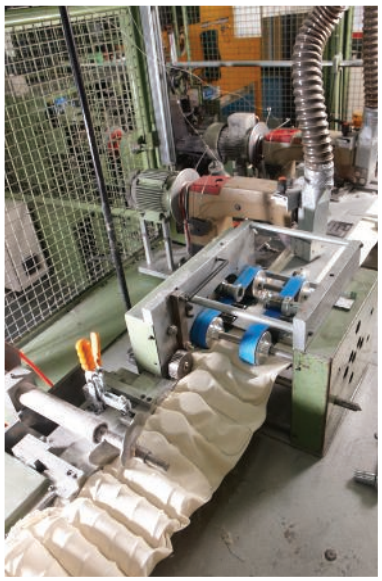
In bed with success

Founded in 1901, Vi-Spring is the "inventor of the modern bed", an ethos it has transferred admirably into the annual production of 135,000 mattresses

Top-of-the-market beds are the name of the game at Plymouth-based Vi-Spring, a company where comfort is priority based on a production recipe comprising craftsmanship and natural materials.

While many of the processes here are inherently labour intensive, this plant is no slouch. For instance, it deploys a bank of 16 automated spring manufacturing machines, with setting and operating procedures recently deskilled through process standardisation. The result is consistent quality and the elimination of variables.

The completed springs move to one-piece flow lines with 20-minute takt times for mattress processes that include nesting, hog ringing, side stitching,



assembly, taping, tufting and inspection. A water spider replenishment system based on a time slot is used to keep lineside materials topped up. Divans are produced on separate lines, while fabrics are manufactured in another area based on flow cells.

Cell leaders have a key role at Vi-Spring. Not only are they responsible for rigorous quality standards – the beds have a lifetime guarantee against manufacturing defects – they must maintain line balance, support KPI achievements, and promote good working practice, safety and morale. Of course, they must also meet production targets and Vi-Spring cuts no corners when it comes to measuring performance: operating productivity, non-productive time, pieces per operator per week, value per operator and monthly output value are all recorded.

Every Vi-Spring product is made to order – no stock is held. A huge product mix of 168,000 combinations is dependent on size, fabric and spring tension – the biggest selling bed commands just 0.15% of this figure. The company uses its own customised Microsoft Access database for planning: orders and plans are synchronised overnight with the company's newly adopted SAP system. The system draws up a rough cut plan, with jobs entering a pool of work to be made in a specific week. Daily labour requirements are then generated, with orders scheduled to the day's production plan.

Impressively, 85% of the company's annual £13 million raw material spend is split among just eight key suppliers. Vi-Spring has made huge strides in this area since 1994, when it had 34 main suppliers. The rationalisation has come about largely by encouraging suppliers to offer non-core products.

While 20% of raw material spend is vendor managed direct to line, a huge 71% is controlled by the stores team (using kanban) directly from the shopfloor, thus nurturing empowerment.

The value of Vi-Spring's reputation means the company takes care of its employees. There are common wage terms and conditions across the workforce that encourages a culture of participation and sharing. A weekly paid, equal-share bonus system is deployed relating to product complexity and volume, while a planned training structure means 60% of operators are currently dual- or multi-skilled. People like it here – only 15% of the 125-strong workforce has served less than five years.

The wool used by Vi-Spring for its fillings is an entire story of its own. Suffice to say the company takes 70% of all the white wool produced by Shetland. It pays above the market rate for the wool to help support around 700 crofters and their families on the island.

This is indicative of a company keen to promote its brand and drive market success. And it hasn't gone unnoticed. Vi-Spring secured a 2012 Queen's Award for Enterprise for its growth in export sales: 39% of sales now originate overseas. What's more, the company now has a Highly Commended in the Judges' Special Award to add to its trophy cabinet.

Unlike its customers, Vi-Spring refuses to get comfortable. Always looking for progress, the company deploys year-by-year operating improvement plans, detailing objectives, responsibilities and targets. Increased adoption of lean techniques since 1994 has left the company in very good shape – there is now the potential to grow the business 50% using existing space! ■

TOP 3 POINTS

- Lean manufacturing used to combat enormous product complexity
- 71% of raw material spend managed by shopfloor staff
- Process standardisation has deskilled spring making set-ups and operations

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