



**BFA**  
**2014**

celebrating  
**manufacturing**  
**excellence**



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# Investing in excellence

*Professor Marek Szwajczewski identifies some of the outstanding qualities that all our Best Factory Award winners display*

**T**his year's award winners cover the spectrum of UK manufacturing. They illustrate the renaissance that is taking place in UK industry – by focusing on high value manufacturing delivered through an emphasis on building world-class factories, they are experiencing sales, export and profit growth.

Reviewing this year's winners, we can see that they share several common traits; they have a clear manufacturing strategy, which is cascaded down the organisation to the factory floor. The winners are customer-focused; they listen to the voice of the customer and have a strong improvement ethos as part of their DNA. There are some common threads that we can see among the plants:

**Safety** – This is the number one priority at all the plants. The good factories are achieving at least one million working hours between lost time accidents. However, the best are achieving well in excess of two million working hours.

**Production system** – Many of the factories are implementing their own production system (mainly based on the Toyota Production System). They are benchmarking their performance and progress against this methodology, and working on ensuring that they are moving up the steps outlined by the approach.

**Lean Six Sigma** – This approach is increasingly becoming the standard approach adopted in all excellent factories. The use of both lean and Six Sigma is helping to deliver improvements, especially in terms of cost and quality. Many of the plants are ensuring that a large proportion of the workforce is familiar with this approach by training numerous green and yellow belts.

**Maintenance** – To achieve operational excellence it is important to have maintenance excellence. The best plants have all implemented TPM and are working hard at getting world-class availability performance from what is, in a number of cases, equipment that is at least 20 years old.

**OEE** – Overall equipment effectiveness (OEE) is becoming more important and is now one of the key factory performance measures that plant managers monitor and improve.

**Environment** – The recycling of waste has shifted from being considered a cost to producing a positive contribution to the bottom line. The best are aiming to recycle all their factory waste and avoiding having to resort to landfill or “waste to energy”, which some would consider incineration. Increasing consideration is being given to recycling factory products at the end of their useful life; this not only improves the reputation with the distributors and customers, but is also a source of income.

**Energy** – Energy costs are relatively high in the UK so factories are increasing their focus on reducing energy consumption. They are reducing costs by investing in the repair of all air lines, installing variable speed drives on compressors and replacing air-driven tools with electric-driven tools. Many are also moving to LED lighting and systems that are switched on by movement. The results are producing reductions in energy usage of over 25%.

**Flexibility** – The plants have a high degree of flexibility and they are upgrading their employees' skills, making them more multi-skilled. They are also reducing set-up times to give themselves a greater ability to cope with changing market demands.

The award winners attest to the fact that investing in the people and the process yields significant results. Several of the winners attest to the importance of continuing to invest, even when times appear uncertain. If the emphasis of the best factories on investment is a reflection of our manufacturing, then it bodes well for UK Plc.

**Professor Marek Szwajczewski**

Director, Best Factory Awards

Cranfield School of Management

**“High  
value  
manufacturing”**

# Strength in quality



**T**oyota Material Handling UK has been involved with the Best Factory Awards for nearly a decade, the last five years as the headline sponsor. We are proud to be associated with this coveted awards programme that continues to grow in strength every year. The strength comes from the quality of the entries, the quality of the awards celebration, but also the quality of the information shared at the Best Factory Conference.

One of the important parts of the Best Factory Awards programme is the recognition and support it provides to the manufacturing industry through the sharing of knowledge. Every company that enters benefits from the benchmark report, plus the opportunity to learn through the experiences shared at the Best Factory conference.

As a sponsor, this is where we have also been able to make a great contribution in the sharing of knowledge. As the world's number one manufacturer of materials handling equipment, our business is driven by the Toyota Production System (TPS). TPS focuses on quality, cost reduction and on-time delivery. TPS has enabled our business to grow, develop and continue to be profitable despite the difficult economic challenges.

The Best Factory Awards has been a great platform for us to understand the challenges many manufacturing companies face, but also share our experiences and ideas. We are partners to many manufacturing companies as their materials handling provider and understanding their challenges as well as their great achievements is important to us.

We continue to be involved with the Best Factory Awards so we can support the great British manufacturing industry by recognising those businesses that show excellence in what they do.

We are delighted to be part of the Best Factory Awards programme that celebrates great people, great processes and great companies.

**Tony Wallis**

Sales and marketing director, Toyota Material Handling UK

# The power of the team



**N**othing beats escaping your tour guide's attention during a BFA judging visit and quizzing an unsuspecting operator about what it's really like to work at the factory.

The message you get back is always the same: 'I enjoy it, I feel I'm a part of a team and doing something that matters'. The best thing about the job? Easy, picking up the final product in a supermarket, pharmacy, garage forecourt or even just despatch, holding it aloft and saying: 'I made this.'

That passion and pride in the job shines through in all 13 finalists. But passion alone isn't enough to carry a site to world-class status. Our winners have skillfully fortified shopfloor enthusiasm with ambitious business objectives. Every individual works towards specific targets that feed into site-level goals like tributaries flowing into a mighty river.

The momentum is turbocharged by manufacturing managers who might these days be better classified as coaches. They're big on encouragement and spotting gaps in employee skill sets. Found out on the training pitch, not brooding in the back office over the tactics board like in days of yore.

The training support championed by this new breed of managers is awe-inspiring. Millions invested in equipping employees with the latest business improvement techniques around 5S, problem solving or team leadership. But, my goodness, do the workforce pay back in spades.

Employees bubble with self-belief and bust a gut to offer up extra ideas about how to make it better, faster, smarter and more cheaply. Two words you'll read again and again in our winners' stories are empowerment and engagement.

The really outstanding factories understand that employees can unlock the performance gains well beyond the spec of even the snazziest new piece of production kit. It's why you'll find operator standing shoulder to shoulder with ops director on the BFA winners' rostrum. Becoming a Best Factory is a team game.

**Max Gosney**

Group editor, Works Management

Works Management and Cranfield School of Management greatly appreciate the support of the sponsors of the Best Factory Awards 2014

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stronger together

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[www.brammer.co.uk](http://www.brammer.co.uk)

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The company also offers a range of value-added services which help its customers to lower total acquisition costs, reduce working capital and optimise production efficiency.

Among these is vendor-managed inventory, which manages and tracks product usage with detailed reporting, a solution which time and time again proves to increase stock efficiency, optimise productivity, and deliver greater control and accountability.

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The Institution of Occupational Safety and Health (IOSH) is the largest professional body in the world for health and safety practitioners.

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# 2014 Best Factory Award


## Factory of the Year 2014

*Sponsored by Toyota Material Handling UK*


 **Winner:**  
City Technology

## Best Process Plant


*Sponsored by Schaeffler*

 **Winner:**  
Alcoa Manufacturing GB


## Best Engineering Plant

 **Winner:**  
Bosch Thermotechnology

## Best Electronics & Electrical Plant

 **Winner:**  
City Technology

## Best Household & General Products Plant

 **Winner:**  
Coca-Cola Enterprises

**Highly Commended:** LINPAC Packaging

## Best SME

 **Winner:**  
InterFlex Group

## People & Skills Development Award

 **Winner:**  
MSD

**Highly Commended:** Alcoa Manufacturing GB

## Supply Chain Award


*Sponsored by Buck & Hickman*

 **Winner:**  
Bosch Thermotechnology


**Highly Commended:** Cummins Power Generation

## Most Improved Plant

*Sponsored by Brammer*

 **Winner:**  
LINPAC Packaging

## Export Award

 **Winner:**  
Cummins Power Generation



# winners



## Health & Safety Award

Sponsored by IOSH



**Winner:**

3M UK

## Innovation Award



**Winner:**

City Technology

**Highly Commended:** InterFlex Group

## Energy & Environment Award

Sponsored by Atlas Copco



**Winner:**

Bosch Thermotechnology

**Highly Commended:** Eaton Production International

## Judges' Special Award

Sponsored by Cranfield School of Management



**Winner:**

Brita Water Filter Systems

**Highly Commended:** Autoglym

**Highly Commended:** Prism Electronics



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## CITY TECHNOLOGY

Winner: Toyota Material Handling Factory of the Year 2014

• Winner: Best Electronics &amp; Electrical Plant • Winner: Innovation Award

# Sensor destiny

Cutting-edge products backed by a razor sharp focus on quality and a powerful commitment to its people has earned gas sensor manufacturer City Technology the coveted Factory of the Year crown



Outstanding quality is the beating heart of City Technology's site in Portsmouth, Hampshire. It runs through everything the gas sensor manufacturer does – from its pioneering production processes through innovative products to the progressive and enlightened way it treats its people.

City Technology, Portsmouth takes complex technology and builds it into products that save lives. Most of its products are electrochemical sensors used in gas detectors. They measure the concentration of gases such as oxygen, carbon monoxide, nitrogen oxide and sulphur dioxide in challenging industrial environments and life-critical medical applications like anaesthesia and respiratory monitoring.

A winning combination of world-class quality, faultless new product introductions and a compelling product range marks City, Portsmouth out as the stand-out site and a worthy winner of this year's top award.

The BFA judges summed the company up like this: "City Technology is symbolic of the high value-add manufacturing which is key

## TOP 5 POINTS

- ▼ Delivery has improved from 87% OTTP (on time to promise) in 2010 to 98% OTTR (on time to request) at the end of last year
- ▼ City has spent around £1 million a year over the last three years on plant, equipment (including production kit, racking and benching systems) and infrastructure (such as suspended ceilings and air conditioning)
- ▼ Turnover has grown by 7% year-on-year for the last two years without increasing headcount
- ▼ The business measures downtime by occurrences rather than by time because it believes that, every time a machine stops, it is an issue. Says Love: "In the last 12 months, we have had a 50% reduction in occurrences from 32 per day to fewer than 15"
- ▼ The City, Portsmouth site produces 1.6 million sensors annually

to the future of UK manufacturing. The site has a crystal clear strategy around producing premium products at low volumes with maximum manufacturing flexibility. The strategy is filtered down to individual goals through comprehensive hoshin planning."

Although it has employed lean principles since 1993, City's journey to excellence really

took off in 2006 when it was bought by global industrial giant Honeywell. At the heart of City, Portsmouth's continuous improvement drive is the Honeywell Operating System (HOS).

HOS site leader Rob Love explains: "HOS is an enterprise-wide, integrated operating system designed to help us improve the way we act, work and lead, resulting in improved





## Tiered accountability explained

The tiered structure employed by City Technology is a 'cascade' system designed to ensure problems are communicated and solved quickly. The site likes to hold lots of meetings, but keeps them short and focused.

At the beginning of each shift, each team leader hosts a 10-minute tier 1 meeting with the operators. They review key performance indicators including safety issues, and quality and product yields to check whether they are above the trigger level at which action becomes necessary.

If a problem is identified that can't be fixed at tier 1, it is escalated to tier 2. City, Portsmouth's business is organised into product groups, each comprising a manufacturing engineer, a quality engineer and the supervisor for that area. These people attend the tier 2 meetings together with team leaders from tier 1. Tier 2 meetings effectively cover the same metrics as tier 1, but at a higher level. So, for example, they will ask: has anything been escalated from production related to safety, quality, delivery, cost or inventory that needs to be resolved?

Tier 3 meetings are functional. So, for example, there is a production meeting where the operations manager meets with the supervisors to go through factory level issues, the quality manager meets with all the quality engineers, and so on. Love explains: "There could be common problems across the different product groups. If there's a pattern, it can offer clues for rapid problem-solving."

Tier 4 is the site meeting and involves each functional leader – including safety, quality, production, HR, sourcing and R&D – and site leader Love. He says: "We don't just cover the standard KPIs, but also look at issues like absenteeism, kaizen (continuous improvement) ideas, whether we used any expedited freight, that sort of thing."

operations. It's based around a foundation of Six Sigma and integrating lean tools and principles, and focuses particularly on organisational development to ensure we create a sustainable improvement culture."

City, Portsmouth has clearly excelled in its HOS implementation – it was the first site in the UK to achieve Honeywell's HOS Silver Award in 2012 (a Gold Award is currently under development). This year, the site went on to attain HOS Silver Excellence.

### Geared to customer requirements

Central to HOS is a production control system geared precisely to customer requirements, which helps minimise stock. All parts forwarded to the downstream production area are subject to quality inspection and testing along the way, which reduces faults in production and means stock can be further rationalised.

Processes within the production area are synchronised to cut lead times and superfluous, non-value-adding elements in the manufacturing chain (such as overproduction, transportation and waiting times) are eliminated. By minimising waste from its manufacturing processes and introducing well-balanced, single-piece production lines, City has seen a 10% improvement in operational efficiency in the

last 12 months (from 76 to 86%).

A strong PDCA (plan, do, check, act) cycle and standardised work (from how it runs its meetings to the way it builds products) marks City, Portsmouth out as an exceptional site, and a single-minded dedication to strengthening its production processes has helped it cut inventory from 63 days' supply three years ago to 37 now.

But City, Portsmouth's progress has not been solely down to process enhancements; it also clearly nurtures its people, encouraging them to contribute improvement ideas, which reinforces engagement and boosts empowerment. The site measures every CI idea suggested by its employees. Says Love: "We have gone from 0.6 implemented ideas per person per month in 2010 to a sustained 2.2 implemented ideas per person per month."

In 2010, the site only considered ideas from the direct employees and a few indirect staff involved in building the products. Today, employees from every function within the four walls of the factory generate improvement ideas.

Simple improvement suggestions are introduced immediately, but bigger ideas involve completing a form which asks challenging questions – for example, which of the seven wastes does this suggestion



## CITY TECHNOLOGY

Winner: Toyota Material Handling Factory of the Year 2014

• Winner: Best Electronics &amp; Electrical Plant • Winner: Innovation Award



recipe for BFA success. The site maintains a comprehensive database outlining the training expectations for each job role. This ensures that everybody gets the right training at the right level and at the right time.

Honeywell offers an accredited internal lean expert training programme and City currently has five lean experts on the Portsmouth site as well as nine Six Sigma black belts and 42 green belts.

Every employee is also involved in training activities in a range of topics including lean thinking, health and safety behaviours, standard process control charts, quality tools, and so on. This year there are 43 training packs, each taking 10 to 45 minutes to complete. Each pack has a test attached to ensure it has been completed correctly and, over the course of the year, every employee will go through all of the packs.

An ingenious tiered accountability process pulls everything together at City, Portsmouth (see the box, below left). It is, effectively, the 'check' part of the 'plan, do, check, act' cycle. Every day, everybody in the organisation takes part in at least one of the four tier meetings that go up through the business.

The process ensures that, if there are problems, they are escalated to the next

level on the same day so that something can be done about them immediately. It also strengthens ownership and accountability. Love puts it like this: "The tier meetings effectively take a daily pulse of the business and check everything that we think is important in the business is working as it should be."

BFA judge Professor Marek Szwajczewski was impressed by this and all the other pioneering City initiatives: "Their manufacturing cells are tight and flexible, with the operators even involved in the design of the cells. A lot of companies pay lip service to this, but at City, although process engineers design the cells, the operators are involved in getting it right."

He added: "They ensure they are building in the quality through various processes as well as using poka yoke, bar coding at the end of the line. And standardised work – following a set pattern – is good and clearly laid out."

As a result, he concluded: "Flexible cells and empowered, committed people mean the business is growing. Sales are up and are forecast to grow incredibly. It is a high-tech product and they have been investing in the manufacturing capability of the plant. They are also investing in capacity for the future." ■

tackle? Love explains: "The idea is to get our employees thinking whether their suggestion addresses our KPIs – safety, quality, cost, delivery and inventory."

However, listening to its people doesn't end with improvement suggestions; City, Portsmouth also measures employee satisfaction levels through an anonymous annual survey. Love again: "Our people tell us effectively what they think of us as a management team, whether we're doing the right things, are we a coaching environment? Are we a training environment? Are people being developed as they would expect to be? Are they being treated fairly and with respect?"

#### Focus groups are set up

An overall satisfaction rating, or positive employee relations score (PER), is created for different criteria, including rewards and recognition, coaching, training, benefits and communication. City analyses the results and puts action plans against them. This involves setting up focus groups comprising a cross section of employees, brainstorming ideas and problem solving.

In 2008, when the PER survey was first conducted, 65% of the questions were answered positively; this year it was 81%.

Training is also a vital ingredient in City's



## City's business objectives

City, Portsmouth has three principle business objectives – world-class quality, faultless new product introduction (NPI) and a compelling product range.

● **World-class quality:** Improving quality means reducing warranty returns and 'out-of-box' malfunctions. Producing consistently reliable gas sensors is notoriously difficult because the chemical reactions during manufacture can be unpredictable. City experienced a failure rate of almost 8,000ppm four years ago. Today, that figure stands at 1,000ppm and the target is less than 250 in five years.

● **Faultless NPI:** This involves focusing on the rate at which new products are launched and their uptake. City uses 'velocity product development' (VPD) to manage and measure NPI activity. VPD is a process that brings together all the functions – R&D, manufacturing, marketing and sales – necessary to launch new products successfully and ensure the right products are delivered at the right price.

City, Portsmouth site leader Rob Love explains: "We ask questions like: are we using common parts, common suppliers? Are we using preferred parts and suppliers? What is the time to market? Is the launch price what we said it would be when we set the project out?"

● **A compelling product range:** Measures of success of this objective include company growth and the breadth of the product range. Love says: "We are the biggest manufacturer of electrochemical gas sensors in the world with the biggest range."

Research and development is a central part of creating compelling products. City employs 24 dedicated in-house R&D people on its Portsmouth site, with another three at sister sites in Poole and Bonn, Germany.

The R&D department is co-located with manufacturing, something that particularly impresses BFA judge Professor Marek Szwajczewski: "Product development at City is excellent and benefits from having R&D on site. The tight coupling of people working together on new products and then designing the processes that go into building the product does a lot to improve efficiency."





## Early diagnosis of machine condition is key to healthy engineering plant and equipment

By monitoring the vital signs, engineers are in control of their plant and machinery and can prevent unforeseen problems turning into costly breakdowns.

Online fixed systems and handheld CM devices from Schaeffler have a proven track record in a diverse range of industry sectors from steel, paper, quarrying and mining to pharmaceuticals, food processing, wind energy and marine. However, the objective is the same: to maximise production output by avoiding unplanned downtime.

Our experienced CM engineers work closely with production and plant personnel to understand and maintain efficiencies and achieve cost savings. Call us on 0121 313 5870 to arrange a no-obligation site visit by one of our engineers.



# Stepping up to the plate

When it comes to aluminium plate manufacturing, only one name comes to mind – Alcoa, a company showing flat out improvement at its Midlands rolled products plant



Alcoa is a shining star among aluminium producers, employing over 100,000 people at 200 locations in more than 40 countries. The company's facility in Kitts Green, Birmingham was established in 1938 with a view to serving the nearby Spitfire factory as the prospect of war loomed. Today, the site is one of only two aluminium rolling mills in the UK, supplying plate products to the world's aerospace, defence, tooling and general engineering markets.

Alcoa makes no secret of sweating its assets to remain competitive. However, the company also sweats its management team. The production control process involves a strategy that centres on balancing objectives such as customer service, manufacturing costs, manufacturing flexibility and inventory. The facility's S&OP 'house' is reviewed regularly against building blocks that include demand management, sales forecasting and process planning on the 'demand' side, and manufacturing evaluation, master scheduling and advanced planning on the 'supply' side.

## A proactive culture

From a CI perspective, the development of a single plan for the whole business (with integrated targets) has seen the evolution of a proactive rather than reactive culture. Moreover, lead times have been reduced, as have inventories. The company also cites better customer service, improved cash flow and easier annual budget updates as further advantages of its efforts.

Operating under the banner of ABS (Alcoa Business System), the 500-employee, 34 acre Kitts Green site has operated a policy of continuous improvement that involves every employee since the 1990s. ABS is underpinned by seven 'stability' tools: TPM; kaizen; problem solving; daily management; a suggestion system; reward and recognition; and communication. These were originated at Kitts Green, but have since become a blueprint at many other Alcoa locations.

Root cause analysis is also deployed by Alcoa along with other tools such as VSM and FMEA. CI is necessary not only because the plant is running at near capacity, but also because aluminium demand is currently growing at a rate of 7% annually,

## TOP 3 POINTS

- ▼ CI has seen output climb 70% in 12 years to record levels without major capital investment
- ▼ Cost savings programme on target to save £3 million in 2014
- ▼ Hybrid maintenance/operator roles deliver plant flexibility

partly thanks to increasing aerospace demand for innovative alloys such as aluminium-lithium. Typical end products machined from Alcoa materials include lower wing skins, spars and ribs for Airbus, Embraer and Bombardier, among others.

A big part of the CI push centres on people development, with empowerment the key theme. An Alcoa cost savings programme called DI (Degrees of Implementation) sees ABS-trained teams tasked with identifying areas that can be improved. The teams gather in DI huddle zones and stage problem-solving sessions involving people from within and outside the area being scrutinised.

In the two-and-a-half years since commencing the initiative, DI engagement from the shopfloor has risen to 93%. The best ideas generating the biggest savings

are rewarded with prizes such as shopping vouchers. To give an idea of scale, Kitts Green is committed to generating savings of £3 million (minimum) from DI in 2014, with £1.3 million coming from the foundry alone. Alcoa clearly values its employees and delivers an interesting environment in which to work. As a result, absenteeism is extremely low, despite a generous 12 months' full pay for sick leave.

Perhaps providing a hint of the 'super operator' of the future, another Alcoa initiative has witnessed the training and development of hybrid workers known as maintenance/operators in the hot rolling section. Designed to give flexibility, these innovative roles are now being rolled out across the company.

So what exactly is the upshot of becoming a centre of excellence in CI? Well, in 2013, the plant achieved record output, with 2014 looking set to be even better. In fact, output has climbed almost 70% in the past 12 years and, while there's been some capital investment during that time, nearly all of the gains have come from CI initiatives.

As an interesting aside, due to ease of recycling, some two-thirds of all the aluminium ever produced is still thought to be going strong. A bit like Alcoa really – this year's Best Process Plant. ■





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# Can't beat the **real** thing

Coca-Cola in Sidcup has blended state-of-the art kit with cutting-edge employee engagement to get production fizzing in the face of ever more challenging supermarket customers

Coca-Cola's factory in Sidcup, Kent is a sea of red. The factory roof, gates, even the operators' hair nets are decked out in the company's trademark crimson. In fact, the only thing that clashes is the the target boards, which are a very definite shade of green. Cost per case manufactured has tumbled 21% since 2009, line utilisation is up from 61% to 75% and 100 cases are produced per employee per day compared with 84 five years ago.

The advances have been fuelled by major investment in plant, multi-skilling workers and a heart-on-sleeves commitment to engage and empower the shopfloor.

Doing it better, faster and more flexibly is critical when the big supermarkets account for 50% of your orders. "They all want differentiation and exclusivity. But also to be able to buy it fast," explains Trevor Newman, director of supply chain operations at Coca-Cola, Sidcup.

Sidcup fields 176 stock keeping units and has a lead time of just over two days for Tesco. The twin perils of high variability and high volume present a major challenge for six bottling and canning lines, explains Newman. "It drives in complexity, changeovers and short production runs, which go against efficiency and yield. Ten years ago we would run 2 litre bottles of Coke for a week. Now, you go from 2 litres to 1.75 litres, 12-pack to 24-pack. That places heavy demands on labour and maintenance."

## Smart kit and smarter thinking

Sidcup's team have found the answers through a mixture of smart kit and even smarter thinking. All plant is less than five years old with more than £70 million invested since 1996. Line seven cans 2,000 Cokes a minute with a seamer machine adding 33 lids a second or 'faster than Superman' in site vernacular.

The seamer isn't the only thing on site with superhuman qualities. The maintenance



team has brought all activity in house, re-trained and targeted reductions in downtime. They're not alone in acquiring new skills, adds Newman.

"Five years ago the mentality was: 'I come into work and operate the filler on line two and I don't go elsewhere. That makes labour productivity hard to drive. We've cracked that with deployment of the 1:3:1 approach – every machine can be operated by three people on each shift."

Change has been coaxing by a leadership team imbued with openness and honesty. A site charter spells out the Sidcup way: leading by example, team empathy and working with the facts. It also lists the lamentable like failing to take ownership. Newman says: "You used to have a breakdown and people said: 'that's an operations breakdown'. That's gone; now we are in it together from the top to the bottom."

A message endorsed by bottom as much as top. One operator comments: "The fact that I'm asked for an opinion on a bottling issue and empowered to run my team, that makes you feel good."

The Sidcup top team aims to keep converting the feel-good factor. All

employees are being tasked with delivering a 1% improvement in one aspect of their role – a move inspired by Dave Brailsford's marginal gains philosophy for cycling's Team Sky.

Peddling together, the ambition is for the 53-year-old Sidcup site to overtake five others in the group and become Coca-Cola's preferred UK factory for investment. Newman says: "When we're trying to engage with people we say: 'yes, it's different to when your mum, dad or even granddad worked here, but the world's changed. We need to keep getting better if you want your child or grandchild to work here in 50 years."

Sidcup, we look forward to seeing you at the BFAs in 2064. ■

**TOP  
3  
POINTS**

▼ More than £70m invested since 1996 with a further £50m planned in the next two years to develop a new canning line and warehouse

▼ Broken down silo-mentality, engaged workforce and multi-skilled employees to work across different lines

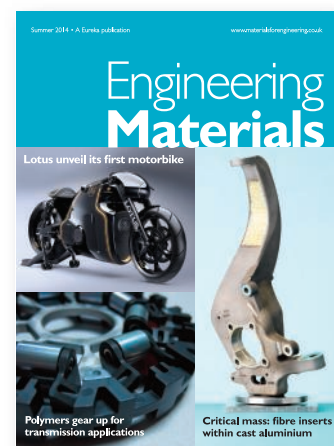
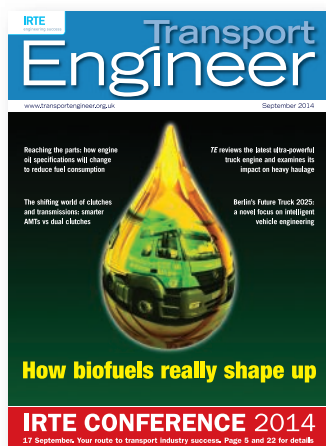
▼ Case fill – a derivative of OTIF – at 97.8%



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# Passionate about engineering



# Burning ambition

Bosch Thermotechnology's Worcester factory is fired up by flexibility. Already a benchmark site within the group for efficiency, this engineering powerhouse has sparked yet more improvement



Outstanding delivery performance is something every manufacturer strives for, but few can match Bosch Thermotechnology in Worcester, which has scooped supplier awards from all its major customers as well as the *Which?* magazine prize for quality and delivery three years running.

Worcester Bosch, as it's known, can now add three more trophies to its cabinet: Best Engineering Plant (for the second consecutive year), the Supply Chain Award and the Energy & Environment Award.

The factory operates a pull strategy, making boilers to order. Unsurprisingly, this is a seasonal business: Worcester Bosch makes between 16,000 and 30,000 per month, peaking each November. Annualised hours mean the working week can flex from 30 to 48 hours to meet demand.

Production peaks also call for slick processes that can flex accordingly. Worcester Bosch is nearing completion on Vision 2014, a project to replace its heavily automated, static lines with a new lean system. 'Any product, anywhere' is the theme: three lean lines are already in operation, the last one will be completed by the end of this year.

Worcester was the first to pilot the lean line concept, which has now been rolled out to others in the division. The system not only boosts production flexibility, but also quality. Each line has 13 check points; product can't move to the next workstation unless it passes, so any problems are identified immediately. "You can't build a bad product here," noted the judges.

Despite winning a clutch of customer awards, the plant refuses to put supply chain improvements on the back burner. Worcester has the supplier side neatly sewn up with kanbans, milk runs and audits: suppliers are assessed and rated, with the results available to all. Suppliers have one-hour delivery slots, with penalties incurred for missing either way.

For customers, a clever strategy to encourage builders' merchants to place smaller, more frequent orders is paying off,

## TOP 3 POINTS

- ▼ Lean line system means any product can be built anywhere, boosting flexibility
- ▼ Outstanding product availability and OTIF of 99.5%
- ▼ Smashed group target on carbon emission reduction and cut energy bill by 25%

with merchants benefiting from holding less stock and the factory from smoother production planning. This has only been possible by gaining their trust: the site profiles merchant inventory and promises next-day delivery, with OTIF at 99.5% or higher.

### Green with envy

Plenty will be green with envy at Worcester Bosch's energy and environmental achievements. It has smashed the group's target to reduce 2007 carbon emissions by 20% by 2020, cutting them by 27% to date. And, despite hikes in energy prices, Worcester's eye-watering annual bill for gas and electric has been reduced by 25%. Solar roof panels, energy-efficient lighting, electric-

and battery-powered tools instead of compressed air, new powder paint that can be baked at a lower temperature, on-site CHP, plus (of course) high-efficiency boilers are just some of the contributors to this impressive saving.

Production waste is segregated and recycled, with zero going to landfill, and Worcester Bosch has an 'upcycling' department, where old boilers are returned and used to generate new parts.

A passion for improvement burns bright here: the workforce has a 'can-do' attitude and is committed to seeking better, safer ways of working. Autonomous maintenance is well established and Worcester is a Bosch centre of excellence for TPM.

Training and development is supplemented with a neat job swapping scheme, which fills competency gaps by enabling associates to swap roles for 18 months. In addition, job shadowing gives employees the opportunity to gain experience of other roles by shadowing individuals for five days at a time – 70 of these have taken place already this year.

A deserving winner of three awards, Worcester Bosch can bask in the glow of its BFA success. ■







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# Living and breathing **safety**

3M, Newton Aycliffe – a factory which makes disposable and reusable respirators – scoops the Health and Safety Award with its impressive commitment to establishing a safety-focused shopfloor culture

3M, Newton Aycliffe's safety record stretches so far back you'd probably have found a diplodocus drinking out of the nearby River Tees the last time there was a lost time incident. A site making PPE practices what it preaches and then some on the way to scooping this year's Health and Safety Award.

Newton Aycliffe has clocked two million working hours without a single recordable injury or lost time accident, a feat which, even in a vintage year for safety standards at the Best Factory Awards, deserves special praise. The judges said: "It's an impressive figure. The bar has been raised on health and safety across the board this year, with several finalists recording one million hours without a lost time accident. But 3M stands head and shoulders above everyone by approaching more than two million."

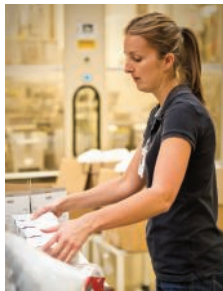
Hitting the safety heights has been a triumph of teamwork, accountability and engagement across the factory's 300 employees. A behavioural safety programme has been running for 16 years. Nearly 250 people have been trained to perform one-to-one safety dialogues with over 6,600 shopfloor-led discussions taking place last year, identifying and eliminating potential hazards.

## Lean management rolled out

Grassroots buy-in has been aided by the site's successful roll out of a global 3M Lean Management System (LMS) 2.0 initiative. LMS challenges traditional 'rear view mirror management' where decisions are referred up the hierarchy to top tier management, explains Colin MacLeod, site manager at 3M Newton Aycliffe.

"LMS allows us to manage in real time," explains MacLeod. "Decisions can be made closer to the source of the activity, typically by operators and first line supervision. This, in turn, creates time for senior site management to focus on strategy and guiding shopfloor activity against the plant's leading indicators."

Operators air their lean ideas at morning meetings around daily accountability boards. Any action points or unresolved issues are escalated to a second tier meeting between team leaders and general



supervisors. General supervisors then meet with product managers on a third tier and so on until reaching the fourth and final top tier: site management.

LMS creates a sense of solidarity and accountability that runs from operator to ops manager, explains MacLeod. "If you, as the operator, are not hitting the targets then drag me, the manager, to the performance board and tell me what I am doing wrong and how I can help. It fosters managers with accountability."

Information flows across the site through impressive visual management. You're always within eye-line of an accountability board displaying the latest KPIs or improvement ideas for the disposable and reusable respirators made at the plant.

Communication is further enhanced by comprehensive hoshin planning. Quarterly shopfloor appraisals were launched two

years ago with personal objectives linked to factory-wide targets around safety, CI, teamwork or flexibility. Reviews also establish necessary training support. Over 141 employees have received external business improvement techniques training on 5S and kaizen problem solving.

## Cutting-edge kit and R&D focus

Investment in people is complemented by commitment to cutting-edge kit and a relentless R&D focus. Robotic automation cells and high-speed packaging lines ensure rapid delivery of high-quality respirators that help protect workforces in the metals and shipbuilding industries. Every piece of plant has its production stats measured hourly by team leaders and reported at daily team meetings.

The finished respirators are renowned for high-performance and quality of fit, attributes honed by the site's R&D area. Here, you can find selfless souls giving up lunch hour to don a respirator and peddle an exercise bike to judge mask fit while having salt particles fired at their face.

Just one of many unsung heroes at Newton Aycliffe, whose determination to add value for customers and do so safely makes the site a deserving BFA winner. ■

## TOP 3 POINTS

- ▼ More than two million working hours without a lost time accident
- ▼ Awarded 3M CEO's award for outstanding safety & health and Order of Distinction from the Royal Society for the Prevention of Accidents
- ▼ Safety-first focus led by highly engaged shopfloor employees who performed 6,600 one-to-one safety dialogues in 2013



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# Handled with **care**

Age is no barrier at LINPAC Packaging's St Helens plant. With incredible care and diligence, this site secures outstanding performance from equipment that, on some lines, is 25 years old

While many manufacturers attribute their success to state-of-the-art machinery, here is a stellar example of a plant that glistens with the effort of sweating assets which, in some cases, are older than the operators.

LINPAC Packaging in St Helens knows how to get the best from its equipment, its processes and its 110-strong workforce. This Most Improved Plant winner stands head and shoulders above others, with OEE at 91% for the year to date – a leap of 10% in two years. Some machines are already hitting 98%.

St Helens is the £550m LINPAC Group's principle site for thermoforming of EPS. That's expanded polystyrene found, in carton form, holding our takeaway suppers, as discs supporting pizzas, and as disposable bowls and plates. Last year, it produced over a billion items – and it's a testament to the site's efforts to cut costs and raise efficiency that it can now export this low-cost product to Europe.

When the group decided to transform this factory from making paint tubs to fast-food EPS products in 1998, it was planned as a back-up site for the UK headquarters in Featherstone, West Yorkshire. But St Helens refused to stay in the shadows and it now outperforms UK and overseas plants by several measures, including its adoption of the LINPAC Packaging Operating System (LPOS).

Instigated in 2003, LPOS drives operational excellence into every corner of the business with common standards and KPIs, and St Helens tops the league. It was the first to reach LPOS level 3: it's currently on 3.5 and will doubtless hit its target of 4 by the end of this year.

While some thermoforming lines have clocked up decades of operation – equipment was brought in from other sites and refurbished – LINPAC really knows how to make this kit sing. What's more, this site in no way suffers from under-investment. Purchases this year alone include £600,000 on scanners to measure base product, £150,000 on an energy-efficient infrared



oven and £1 million on end-of-line automation. Ambitious targets to

boost volume and profitability call for carefully targeted expenditure, linked clearly to strategy, vision and goals.

Out on the shopfloor, four extruders and 10 thermoformers are manned by a lean team of 20, with a five-shift system on annualised hours.

## Waste is recycled and reused

Virgin and reclaimed polymer is mixed with talc and butane gas before passing to extrusion. Rolls of foam are made in three widths, up to 42 inches, then cured for between two and six days, depending on size. This allows butane to be released, but more importantly allows atmospheric pressure to build in the polystyrene cells for maximum expansion when heated. Once cured, rolls are transferred to thermoforming and made into discs, trays, cartons and bowls. All waste throughout the manufacturing process is recycled and reused.

Operators are involved in regular maintenance and checks, with each line stopping for 30 minutes a day for cleaning, and for eight hours every six weeks for planned maintenance. But St Helens has

gone much further, developing a comprehensive nine-step asset care programme for its 'category 1' machines – those that are critical to the site, including extruders, thermoformers, pallet wrappers and compressors. The asset care board, a multi-level team, meets every Friday to assess equipment performance data, plan a schedule for improvement and ultimately develop best practice for prevention, all of which drills down into actions for every line.

There are those who say high-volume, low-cost production can no longer succeed in the UK. They should visit St Helens. This site has quality, service and price wrapped up with outstanding efficiency. And now it has a well-deserved Best Factory Award to complete the package. ■

## TOP 3 POINTS

- ▼ Nine-step asset care programme has transformed OEE in the last two years
- ▼ St Helens is the top scoring site for operational excellence within LINPAC Packaging
- ▼ Living proof that high-volume, low-cost production can succeed in the UK

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# Switching up efficiency

The past year has seen Eaton Production International continue to evolve its production processes in line with the company's ongoing pursuit of perfection



Continuous improvement is a way of life at the Worksope facility of Eaton Production International, where refinements in the manufacture of cam switches and disconnectors for builders of machinery and plant equipment ensure the business remains competitive in a highly combative market segment.

Every year the site is expected to make cost-outs and the 12 months since the BFA judges last visited the site have been no exception. A case in point is Eaton's holistic moulding project, which focused on achieving cost-out in three key areas of the moulding process: energy reduction, raw material reduction (the site's biggest spend area) and cycle time reduction. A combination of innovative tool design, machine selection and optimisation of settings has yielded remarkable results: reductions in scrap, unplanned maintenance, overtime at premium rate, inventory, energy consumption and cycle times are offering annual savings in excess of £150,000.

## Machines use half the energy

Energy is indeed a central focus area at Eaton. Among recent initiatives is the installation of five, 40 ton injection moulding machines that use around 50% less energy than the machines they replaced. Furthermore, energy-efficient lighting has been fitted throughout the plant, while the canteen/office building now features energy-efficient windows. On the shopfloor, a compressed air survey helped identify and eliminate all leaks and the shift to more energy-efficient electric screwdrivers on the assembly lines (replacing pneumatic models) has paid huge dividends.

From an environmental perspective, the company is currently evaluating three suppliers that can help Eaton meet its goal of zero-to-landfill by 2015. This will apply the finishing touch to considerable green efforts in recent times. For instance, only 2% of plastic waste at Eaton cannot be reused – down from 8% not so long ago. In fact, site waste in general has declined from 96 tons to just 10 tons in the past five years, while greenhouse gases have reduced by 9% in three years.

## TOP 3 POINTS

- ▼ Factory layout project sees two central parts 'supermarkets' eliminate multiple inventory locations
- ▼ Holistic moulding project generates savings in excess of £150,000
- ▼ Numerous environmental initiatives help the company move towards zero-to-landfill by 2015

These impressive business outcomes have been matched by innovation in shopfloor production processes. Indeed, the past year has seen Eaton implement a factory layout project objective to realise its FSVSM (future state value stream map). Starting with a blank canvas, the entire project was driven by a cross-functional team and involved all shopfloor employees. Everyone had training sessions in VSM as part of the ELSS (Eaton Lean Six Sigma) system. Using a PDCA (plan, do, check, act) process, ideas generated by brainstorming were categorised accordingly and put forward for consideration.

The approach used to align FSVSM to the new layout centred on material flow. The team carried out 'waste walks' and re-evaluated all inventory levels, eliminating

multiple inventory locations in the process. In their place, the Worksope site now has two central component 'supermarkets' for building and packing inventory which give greater focus on product flow and process alignment. In total, the layout involved the relocation of 272 items of equipment/machinery, a task that was completed within two weeks with no loss of production, zero injuries and no premium rate hours.

The results are extremely impressive, with savings in assembly labour, stock take (machine hours) and third party kitting processes combining with the creation of floor space for future insourcing opportunities to offer a total project saving of around £91,000.

Eaton Production International is clearly going from strength-to-strength. Indeed, sales were up 13.6% in 2013 over the previous year, with equally impressive gains in manufacturing profit and operating profit. CI is without doubt the underlying secret behind the company's success. However, Eaton is keen to point out that CI is a journey, not a destination, and reflects the company's never-ending pursuit of perfection. The realisation and appreciation of this fact by the Worksope site shows that this is a switched-on performer. ■





# Fit for the future

Despite BFA acclaim in 2008, tablet maker MSD Cramlington then faced the bitterest pill of all – closure. But trusting every individual to commit to the site’s turnaround has paid dividends and MSD is now flexing its manufacturing muscle



When it comes to burning platforms, few are more scorching than the threat of closure. That’s what faced MSD (formerly Merck Sharpe & Dohme), Cramlington in 2010.

Standards hadn’t dropped since MSD achieved BFA acclaim in 2008, but a combination of market factors and US parent Merck’s 2009 merger with Schering-Plough meant the site was at risk. Its impressive revival has resulted from a determination to be the most competitive plant in the group.

MSD’s survival depended on maintaining reliable, compliant supply, but at a lower cost. Martin Inskip, senior director of operations, pulled together a team to decide how best to communicate the threat to his 360-strong workforce. ‘Don’t gild the lily’, they told him.

His stark message worked: ‘Do you want this site to become another supermarket?’ This was crystallised by his ‘£4 vision’ – to produce tablets at £4/thousand. It proved a winner and still underpins all decisions, with everyone understanding how a purchase, changeover, or improvement affects this number.

In 2011, Cramlington became the back-up facility for Januvia, a type 2 diabetes drug. The site’s razor-sharp focus on reliability and cost resulted in Merck’s decision last year to make MSD the main global producer for

Januvia, as well as 12 other products for existing and emerging markets.

Greater product complexity means the site has doubled its SKUs to 700. It produces 4.5 billion tablets each year, 90% of which are exported – some in bulk and some packaged.

## Worldwide manufacturing strategy

As well as its own £4 vision, Cramlington is committed to Merck’s worldwide strategy for manufacturing. Called Target 15, it sets goals to enable Merck to compete in a changing pharmaceutical sector, delivering more drugs to more of the world’s population. This demands high-performance processes, products and people – which Cramlington has in spades.

Asset reliability is high, driven by rigorous application of TPM and

continuous improvement. A £12 million investment programme is streamlining efficiency and costs, and providing the foundation for expansion. It includes two new coating machines, compressor upgrades and a new powder charging unit, which could ultimately halve cycle time and costs for the main product.

Ability and creativity course through Cramlington’s veins. Empowerment and inclusion are well established, and trust runs deep here, as Inskip describes: ‘We’ve never had a union. No one is asked to clock in; everyone takes responsibility for their own time and work.’

MSD gives people the tools to make change happen. Two years ago, it embarked on a plan for 100% Six Sigma yellow belts. It’s a huge commitment and is almost

complete – 93% of operators are now qualified. Every employee, no matter what level or department, attends the two-day course, with a project assignment relevant to their area.

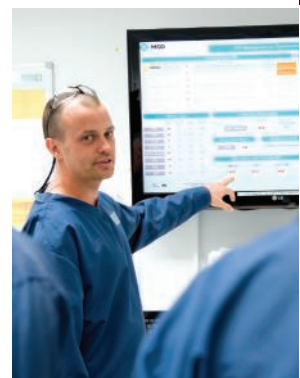
The site’s apprenticeship scheme has restarted after a break of several years. It has taken on five apprentices this year: two in engineering, two for the laboratory and another for the warehouse.

Appraisals are tightly linked to career development to unlock potential. Individual development plans identify untapped talent and skills gaps, enabling MSD to target training and spot the best candidates. In the last 18 months, 54 people have been involved in a career progression assignment, applying new skills by covering long-term leave or projects. It gives MSD unrivalled workforce flexibility, but also gives its people the opportunity to step up and prove themselves.

Cramlington has displayed pride and persistence. It won over the doubters who penned its potential closure, becoming a major global supplier. And now it has a glowing report from the BFA judges, as the winner of the coveted People & Skills Development Award. ■



- ▼ The ‘£4 vision’ to produce tablets at £4 a thousand clarifies how every penny impacts the cost of production
- ▼ Goal to have 100% Six Sigma yellow belts is almost complete
- ▼ Supreme career development programme uncovers talent and potential



## CUMMINS POWER GENERATION

Winner: Export Award Highly Commended: Supply Chain Award

# A global superpower

Cummins Power Generation, Ramsgate retains the Export Award after another outstanding year exceeding generator buyers' expectations across the globe while cutting manufacturing unit cost

There'll always be an England. While there's a remote polar research station or African mine requiring power, you'll find a little piece of Kent keeping the lights on.

Cummins Power Generation, Ramsgate global stock continued to rise in 2014 and the plant deservedly retains the BFA Export Award. International sales have soared to 96% of orders compared to 85% two years ago at a site that's a global centre of excellence in the manufacture of mid to high power generators (defined as a unit with a tank of 50 litres plus). Customers from Moscow to the Middle East seek generators famed for reliability, performance and build quality.

Surpassing expectations in all three areas is top of the agenda for the site. And, as if that wasn't enough, there's the extra conundrum of building it cheaper too. Reducing the conversion cost to turn raw materials into finished generators has been the focus for Ramsgate since last year's BFA win.

Synchronising work flow has been one way the site has helped deliver in 2014. A fabrication area has moved to Ramsgate from a dilapidated sister site several miles away. Co-location has bolstered quality and efficiency, explains Craig Thomas, site operations manager. "It allows us far greater control over quality and to reduce the amount of stock holding. We used to drive our bed frames here to arrive five days before we built. Now, when the bed frame is required, it will trigger the laser to cut the product, fabricate, paint and it comes straight to the line."

When the unit arrives, operators no longer leaf through reams of paper-based standard operating procedures. Instead, they simply tap on a work-side touch screen for instant instructions.

The thumbs-up for digital SOPs came during pre-launch trials involving generator build teams. Employee engagement is seen as essential to realising cost reductions. Ramsgate has pioneered a *Dragons' Den*-style panel where employees pitch cost saving ideas. 'I'm in' has been uttered on 17



out of 60 pitches so far and yielded \$151,000 in savings (Kent reports in dollars to Cummins' US HQ). One successful group of entrepreneurs spotted the site was using just 2m of a 250m cable reel in generator build, and scrapping the rest. At 26p per metre, you don't need to be Duncan Bannatyne to see the business potential behind more expedient use of the reel. The project could save nearly £3,000.

#### Site set to recoup \$4.2m

Alongside the *Dragons' Den* initiative, the site has continued to pursue Six Sigma projects. Two

Ramsgate employees

TOP  
3  
POINTS

▼ Bringing the sister fabrication plant in-house and strong employee focus has helped the site hit the hallowed \$171 conversion cost per generator unit per standard hour

▼ On-time delivery running at 99%

▼ Over \$150,000 saved in *Dragons' Den* cost saving ideas from employees

won Cummins Chairman's Quality Awards for Six Sigma projects on the supply chain and environment last year. The site is on course to recoup nearly \$4.2m in 2014.

From detailed Six Sigma analytics to simple lineside ergonomics, Ramsgate revels in ideas big and small. The site warehouse now unpacks critical components before they reach the line after kaizen activity spotted operators spending valuable time delving through packaging. It's one of a series of adjustments to boost lineside flow that have seen takt times tumble from days to minutes and helped the site keep on top of lead times of four weeks.

All offered up with a smile from a workforce brimming with knowledge and trained relentlessly. Each operator has skill sets assessed on a skills matrix with individuals given a minimum, maximum and actual score in a stat fest reminiscent of *Sky Sports Monday Night Football* show.

It's symbolic of an attention to detail and commitment to employee-led excellence that has helped Ramsgate achieve a \$171 per hour conversion cost on 12% fewer hours than in 2013. From Kenya to Qatar, customers must have been lining up to say well done ever since. ■





## INTERFLEX GROUP

**Winner:** Best SME • **Highly Commended:** Innovation Award

# Packing a punch

Focused on value-added packaging for a host of household brand names, the Sunderland plant of InterFlex Group has grown turnover by an impressive 60% in the past four years

The InterFlex Group is a global, six-site, \$200 million turnover concern with a proven track record of innovation in advanced packaging matched with market leading quality and responsive customer service.

Like most businesses, however, it hasn't all been plain sailing, particularly in the UK, where the company says it has to reinvent itself almost constantly in the face of squeezed margins and ever greater customer demands. Indeed, the five-year strategic plan instigated by current UK managing director Graham Tilley has seen the business make a conscious shift away from commodity 'me-too' products towards high added value packaging markets.

Today, the organisation describes itself as a recognised expert in flexographic printing and coating techniques, multi-film laminations, paper-film strip laminations and wax coated paper. The Sunderland facility of the InterFlex Group is a well invested and highly lean manufacturing plant – a 24/7 site that uses its print assets and technical capability to demonstrate high quality flexographic printing with all the associated speed of response and cost advantages this process brings. Indeed, the facility has recently placed a £1.6 million order for its second 10-colour flexographic printing press.

The company has also developed a new in-house solution to performance films (oxygen barrier technology): the first linear solvent-free laminator in the UK is set to double the site's drying capability and OPOH (output per occupied hour). This is just one example of a facility determined to offer products, processes and services that deliver market differentiation. Another case in point is the recent installation of a £300,000 machine able to produce up to six different formats of pre-formed stand-up pouch.



According to InterFlex Group, none of its UK competitors offer pouch making and printing, thus presenting a real opportunity to grasp a market in its infancy.

If the vision of a highly automated plant is provoking thoughts of an energy guzzling monster, think again. The company is actually showing energy reduction in the realm of 1.8 million kWh per annum through initiatives that include replacing a catalytic oxidiser with a regenerative thermal oxidiser and changing all factory lights from sodium to fluorescent T85 proximity lighting.

If any remain in doubt, innovation is the key theme at this 88,400 sq ft, 115 employee business. For example, from a

regarding innovative barrier technologies with potentially huge shelf life benefits. Based on nanotechnology, the SLE (shelf life extension) project has the potential to be an industry game-changer, offering oxygen and handling properties superior to any other film type currently available. This could be great news for the company's customers, which currently include names such as Warburtons, Nestlé, Bernard Matthews and Kerry Foods.

Although the average batch run here is 40,000m (produced at speeds of circa one mile every two minutes), there is of course a degree of seasonality in the company's core markets, while certain other peaks are driven by customer/retailer promotions (often without notice). Responsiveness is clearly vital, which means all machines here are subject to planned preventative maintenance every 3.5 weeks on average to ensure weekly production plans are met.

Ultimately, ongoing innovation in product development and processes has helped transform this plant. In the past four years, turnover has climbed an impressive 60%, while the company's credit rating now stands at 99, a far cry from where it was previously, allowing the business to negotiate much more competitive deals. In short, the revitalised Sunderland facility of InterFlex Group today offers a value proposition through customised, engineered solutions backed up by a timely and flexible development process, and responsive technical staff and local field support – the deserved recipient of this year's Best SME award. ■



### TOP 3 POINTS

- ▼ Turnover boosted 60% in the past four years
- ▼ All machines subject to planned preventative maintenance every 3.5 weeks on average
- ▼ Product and process innovation used to provide market differentiation

product perspective, Packlinc is a type of 'watermark' on the packaging that purchasers can scan with a smartphone to access real time special offers, product and brand information, and social media links. This move towards 'intelligent' packaging is helping InterFlex Group customers spread their marketing message.

Further developments are also afoot





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# Still sparkling

There's more than one element of excellence at Brita Water Filter's Bicester factory – the constant stream of improvement projects and slick processes make this a standout site

Boasting 85% of UK market share, Brita Water Filter Systems is justly synonymous with the filtered water we all enjoy. The German family-owned business has expanded from water jugs to filters for fridges, dishwashers, kettles, even coffee machines and car washes.

What sets Brita apart is the filter ingredient mix – like all the best recipes, it's a jealously guarded secret and the Bicester site holds the key.

Since it moved from Sunbury, Middlesex to Bicester 10 years ago, the UK operation has flourished, improving efficiency and productivity. It consistently outperforms its German and Swiss group counterparts.

Bicester is home to two lines for household cartridges: one for the Maxtra filter, the other for its predecessor, the Classic. Of the millions made here each year, 60% are exported, with China a notable growth area. In the UK, Brita cartridges are found in most supermarkets; the site also produces own-label products for major retailers.

## A good supplier in action

Brita's team regularly visits customer warehouses to check product and packaging integrity, suggesting improvements and resulting in several awards. One major supermarket even sends merchandising recruits to Bicester as part of their induction to see a good supplier in action.

The shopfloor is clean and well organised – it's not compulsory for a product of this type, but Brita chooses to manufacture to food-grade standards and is accredited by TÜV SÜD.

Raw material costs are high, with ion-exchange resin an expensive ingredient, making the quest for process efficiency all the more vital.

Other ingredients include silverised resin, synthetic resin and carbon – the precise mix depends on the international market. As well as the recipe, Brita's USP lies in the mesh in the cartridge lids, so these are manufactured at the Swiss plant, arriving here twice a week.

Packaging wouldn't typically be core for a manufacturer, but this gives Brita an edge. Cartridges are packed for the B2C or B2B

## TOP 3 POINTS

- ▼ Bicester regularly outperforms Brita's German and Swiss plants on OEE and changeover times
- ▼ Cartridge assembly is an impressive process, with smart use of automation
- ▼ Improvement journey is built on excellent foundations, with fully engaged people

markets, with labelling and pack sizes to customer demands.

The factory runs 24/7, five days a week, using weekends for additional capacity. Lead times are day one for day five, but can be day three for urgent orders. Bicester's ability to react swiftly has paid dividends, resulting in last-minute orders from UK retailers when overseas suppliers fail to come up with the goods.

All, 54 operations employees are focused sharply on improvement, with part of their bonus reliant on audited achievements for activities such as 5S and TPM. Best practice groups share knowledge with the German and Swiss plants on issues such as health and safety, and quality.

Bicester tops the Brita league for OEE and changeovers. OEE is calculated per shift: results were displayed in each cell, but are now on a central noticeboard, leading to healthy competition to hit the 90% target.

Two filling machines, custom built, are models of process efficiency. After mixing in 800-litre batches, the filter mix is dispensed into cartridges, which are weighed and sterilised before being packed. "They've invested wisely in automation," said the judges. "Clever camera systems mean that even a speck of carbon will result in rejection of a cartridge."

Investment has underpinned improvement and includes £250,000 in March this year for a new steriliser. In 2011, a loose line was installed at a cost of £200,000: when the main packing machine stops for changeover, cartridge production can continue and they are diverted here.

"This site has a well-considered approach to improvement, always getting the basics right before moving to the next stage," noted the judges.

Brita demonstrates what can be achieved when even a dominant market leader refuses to allow complacency to take root. It's a worthy winner of the 2014 Judges' Special Award. ■



# Polished performance

A British manufacturer of premium car care and valeting products, Autoglym has grown its original range of 11 products to more than 100 which are now sold in 45 countries



Autoglym is a shining example of outstanding process manufacturing. The vehicle cleaning and protection supplier is one of a select group in the UK – the holder of not one, but two, highly prized Royal Warrants. That makes its claim of quality excellence more than a mere unsupported assertion; it has been recognised by the households of both the Queen and the Prince of Wales.

Established in 1965 in Letchworth, Hertfordshire, Autoglym's core business is the design and blending of car shampoos, polishes and waxes to clean and protect everything from an old banger to a Formula 1 racing car. Its products are used by a variety of customers including vehicle manufacturers, distributors, bodyshops, professional valeting companies and transport operators.

## Dedicated CI team

Autoglym's thirst for continuous improvement has seen it set up a dedicated CI team to drive improvements on the shopfloor. The factory – which has seen an investment of £570,000 in production and storage equipment in the last two years – is organised to get raw materials as near as possible to their point of use and minimise double handling.

This has resulted in big savings. For example, streamlining the 'Super' line – Autoglym's main retail filling line – has boosted productivity by 7% since the start of 2012 and overall equipment effectiveness on

the Super line has improved to an average of 80.4% from 64% at the beginning of 2012.

Another structural change has enabled the company to resolve a thorny dilemma that goes to the heart of its production process – is it a high volume, low margin manufacturer or a premium, small volume, high margin business?

It has resolved this in a positive way by separating its production processes into niche (premium) products and runners (basic, fast-selling products).

Autoglym director Paul Phillips says: "Creating that differentiation has made a huge difference because we no longer break



into production runs to fill niche orders. We accept niche as being a valuable option rather than an annoying added extra." Autoglym has also rationalised the ingredients in its products by changing chemical formulations and, with some suppliers, changed from separate bottle or drum delivery to bulk deliveries in tankers. Doing this saved on packaging waste, reduced handling and resulted in a 9% productivity gain.

But Autoglym's dedication to business excellence doesn't stop with changes to its working methods. It is also dedicated to strengthening its relationships with suppliers and workforce. The company encourages contact with suppliers at

different levels so that, for example, the technical teams in each company talk to each other or Autoglym's marketing team is in contact with the supplier's design team.

This, says Phillips, has resulted in several win-win initiatives: "For instance, we used to have drums of raw material rolling up and down the yard during offloading by a supplier; this wasted time. We therefore arranged to rent a trailer from the supplier and, when they deliver, we use their trailer for storage. That saves them waiting time and we have an extra storage dock, so everyone's happy."

Autoglym has been recognised seven times in a row in *The Sunday Times* list of the



UK's 'Best 100 Companies to Work For' survey, testament to its clear focus on keeping its employees motivated.

It is currently multi-skilling the manufacturing workforce to create cross-functional teams. Within a year all 80 factory employees (out of a total workforce of around 120) will be trained in half of the jobs performed on the shopfloor. Multi-functional teams enable Autoglym to flex labour through the assembly area, increasing versatility and productivity. Phillips reckons it has resulted in a 28% increase in assembly productivity: "We are producing 14% more products with 14% fewer people."

The impact of these initiatives has been a sparkling 15.1% boost in total productivity at Autoglym since the start of 2012. ■

## TOP 3 POINTS

- ▼ Autoglym has grown at 5–7.5% in volume over the last two years
- ▼ The company spends an average of 2.6% of its turnover on R&D at its dedicated on-site laboratory
- ▼ Fitting low energy lighting has saved Autoglym 15% on its annual electricity bill. It has also invested in an intelligent gas controller which links gas heater output to outside climate. This has cut its gas bill by 15%

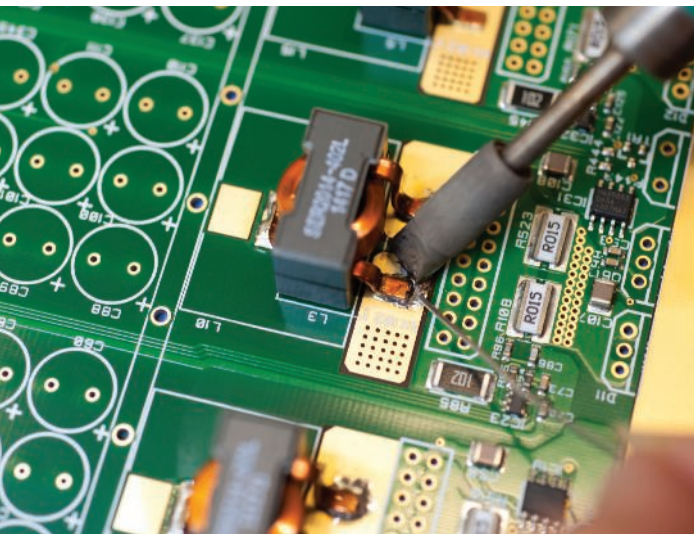


# Guiding light

Prism Electronics is demonstrating how, after a tough recession, the business has fought back to become fitter and more successful than ever

The recession hit many industries hard, but few harder than electronics. With end users reigning in capital expenditure plans, the entire electronics supply chain took the hit and Prism Electronics, a 40-employee, privately-owned contract electronics manufacturer (CEM) in St Ives, Cambridgeshire, was no exception.

Rather than mope in the gloom that recession brings, the company decided to come out fighting. To begin with, the business shifted emphasis, creating a clear plan to focus on the supply of modest volumes of complex products to a relatively select number of capital equipment OEM customers.



This would help differentiate the company from the circa 250 other CEMs in the UK.

"We also wanted to be more customer-focused and develop a better rapport with our clients," says head of operations, Paul Williams.

A case in point emerged two years ago as a result of a customer survey, which highlighted the need for greater engineering back-up. As a result, Prism Electronics expanded the engineering department and recruited an engineering team leader.

The customer-centric tactic certainly appears to be working. Not only is the company enjoying sales that now exceed pre-recession levels, but growth of 5-6% per annum is forecast moving forward. It's expected that this will be achieved through a

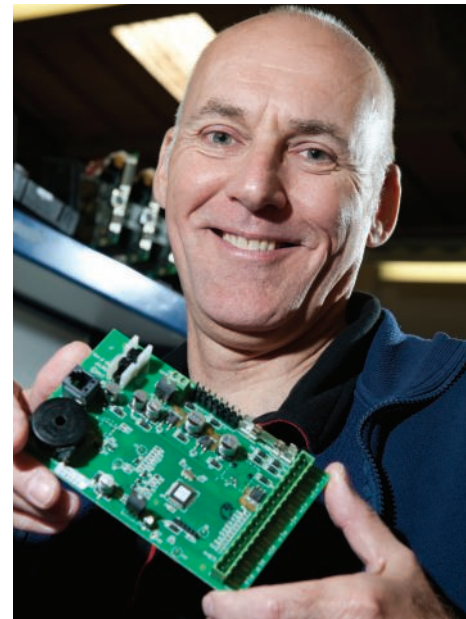
mix of greater business from existing clients, and winning new customer accounts. OEM markets served by Prism Electronics include medical lasers, scientific instruments, railway signalling, commercial dishwashers, coding/printing systems, machine vision and gas detection to name but a few.

From a CI perspective, Prism Electronics tries to involve all employees, based chiefly on weekly reviews of the 3Cs (concern, cause and countermeasure). These help reduce waste, drive out cost and improve quality. According to Williams, such efforts are in the interest of everyone as the business operates a profit share scheme.

Another recent business strategy has seen Aegis manufacturing operations software introduced to help the business move towards paperless process execution, WIP tracking, routing control, and quality and test data collection. The software is already streamlining the company's engineering control and production information handling.

In common with other manufacturers, Prism has seen significant growth in the frequency of new product introductions (NPIS). Coupled with increasing volume of design data, this has put more emphasis on rapid data assimilation, error checking and effective integration into manufacturing. With Aegis software now providing a direct link and tight control from the original design data right through to delivery, NPI procedures are much improved.

Aegis can accept the majority of customer input from a variety of CAD data. Modifications and concessions are checked, managed and incorporated seamlessly into the resulting manufacturing



information. The integrated tools ensure that this is distributed with high confidence and low risk to production.

For densely populated boards of 1,500-plus components, often without printed component identities, the facility for operators to search the assembly image on-line at their workstations and focus on areas of interest is not only essential, but highly valued.

The shopfloor at Prism Electronics is organised by teams and sections (surface mount, conventional assembly and test). Team leaders have responsibility for three-week rolling capacity planning; manufacturing services extend from automatic surface mount component assembly with on-the-fly component verification, through electromechanical assembly to automatic optical inspection, and much more besides. The common strategic goals align to the company's business plan: on-time delivery; fault-free product; the achievement of labour and material margins; and a flexible, responsive and skilled workforce.

Prism Electronics is well aware of the market challenge. The company must continue adding value for its customers through high level, differentiated services. Only this will sustain profitable growth against fierce competition. ■

## TOP 3 POINTS

- ▼ Engineering support team expanded to better serve customers
- ▼ Manufacturing execution software has streamlined the company's engineering control and production information handling
- ▼ Team leaders have responsibility for three-week rolling capacity planning



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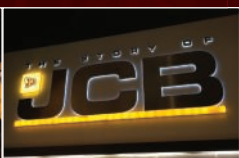
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