

# Sustainable Manufacturing

## Manufacturing a sustainable future

*Modern manufacturers recognise the need to use resources efficiently. This extends right through the production process where they need to be very cognisant of the resources they use, by-products created and ultimately waste that cannot be used. You will find that manufacturers are very careful to use the minimum of resources, transform or modify those resources as efficiently as possible and when the process is completed, create as least waste and by-products as possible.*

*In Geelong, manufacturers are leading in programs to reduce waste and the impact on the environment as part of their commitment to sustainability.*

*With the help of Sustainability Victoria, over the past year the Geelong Manufacturing Council has facilitated a number of tours and workshops where these achievements have been communicated to over 345 industry participants.*

*Based on the strong feedback from this program, we are keen to continue this in the future and expand upon the program to assist companies achieve world's best levels of excellence - Patrick McCaffrey, Geelong Manufacturing Council Chairman.*

Some of the results achieved by manufacturers in Geelong and highlighted in the case studies include:

- Material yield increased by 9% to 85%
- Production efficiency improved by 18%
- Sand disposal reduced by 67%
- Overall performance increase by 20%
- 39% reduction in waste generated from site
- 57% reduction in water usage
- \$10m annual saving in energy use
- a 29% reduction in waste to landfill

David Peart, Executive Officer of the Geelong Manufacturing Council said that this program highlighted the opportunities to learn from best practice companies but importantly that Best Practice was a journey not a destination and even the best companies were looking to benchmark and learn from others.

Industry has told us that this program has been tremendously rewarding as it exposed industry to leading edge thinking, across a diverse group of industries. They have clearly told us that they want this type of program to continue in the future as it adds value to their operations by helping them to become more sustainable.

As part of a strong push in this area the Geelong Manufacturing Council is working to form an environment managers group to consider a range of sustainability issues.



### An exciting new era of sustainability...

Sustainable manufacturing and world class manufacturing are one and the same.

Environmentally sustainable products, services and technology are all crucial to the global performance and future excellence of Geelong's manufacturing industry.

Sustainability Victoria is proud to partner with the Geelong Manufacturing Council to show local industry how efficient resource use can pay off in investment decisions.

Together, we launched a productivity and efficiency network in December 2004 to demonstrate the importance of resource efficiency to industry competitiveness and profitability, and showcase local companies that are achieving sustainable outcomes.

Based on the success of this initiative, I am pleased to announce that Sustainability Victoria has recently committed a further \$100,000 to the Geelong Manufacturing Council to continue to build the capacity of the region's manufacturing sector to deliver resource efficiency improvements.

As a major sponsor of the 2006 Victorian Manufacturing Hall of Fame, Sustainability Victoria also wishes to congratulate local companies Alcoa and Air Radiators on their induction into the Hall of Fame for outstanding success and world-class achievement.

Geoff Mabbett

Chief Executive



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# Sustainable Manufacturing

## Godfrey Hirst

### Carpeter bags awards



Geelong carpet manufacturer Godfrey Hirst is living proof that manufacturing industry has a sustainable and profitable future.

During the last 10 to 12 years the business which employees nearly 800 employees has been evolving to become a more efficient, cleaner and far less wasteful producer and is reaping the rewards of doing so.

By investing in more efficient machinery, the business now uses less power, less water and bins less waste.

For example, Godfrey Hirst is also very dependent on water for cooling machinery. It uses about 130 litres an hour.

Now it has introduced a system that recycles that water – saving about 85 megalitres a year – a saving of about \$160,000 per annum off the water bill. The company expects that investment to pay for itself within 18 months.

A similar 'mindset' was employed in terms of power costs – and its role adding to greenhouse gases.

During the last 12 years Godfrey Hirst dye house equipment has gone through a complete overhaul.

State-of-the-art equipment has cleaned up the process and made it more efficient.

For its success in reducing greenhouse emissions it was presented with the medium business award for "Outstanding Achievement in Greenhouse Gas Abatement" at the Greenhouse Challenge Plus Awards at Parliament House in Canberra last September.

The awards recognised outstanding achievement by business and government departments and agencies across Australia that have implemented innovative processes, systems or procedures to help reduce greenhouse gases or to offset emissions that their organisation produces.

Godfrey Hirst was acknowledged for the considerable efforts of all of its personnel and operations in the improvement of its environmental process, through advancement in carpet dyeing efficiencies, reduced water consumption, waste reduction and recycling initiatives.

For its success in saving water it was also honoured as a joint 'Award for Excellence' winner in the Victorian Savewater awards last year.

It was honoured for developing a system to capture and treat seal water used in the carpet dying process, which can then be reused on a closed-loop, continuous basis.

This innovation is saving more than 232 kilolitres of water per day – equivalent to 85 Olympic sized swimming pools a year.

Godfrey Hirst has also been recognised for its efforts in cutting waste – earning Waste Wise accreditation for its savings. It has reduced its wastage by about 50% in three years.

Brian Cassidy, Engineering Manager at Godfrey Hirst, said the company is proud of its achievements and was committed to a sustainable and profitable path.

"It's a mindset and the company's keen to pursue these goals right to the end.

"This is all about sustainable production – That's what it's all about - grabbing the message and promoting that throughout the industry."

## Blue Circle



### Materials Efficiency/Cleaner Production

Blue Circle Waurn Ponds is moving to world's best practice in alternative fuels and cleaner production.

Blue Circle Southern Cement (BCSC), located in Waurn Ponds near Geelong, employs 100 people, and produces around 10% of Australia's cement. As the only cement manufacturer in Victoria, BCSC has recently finalised a major upgrade which will take the company to a leader in its field. The upgrade will allow the plant to increase its capacity and increase the alternative fuels used in its processes.

The plant manufactures Portland Cement and the upgrades will lift capacity by 60% to 800,000 tonnes per annum. Following the upgrades, the company will exceed world's best practice in use of alternative fuels.

### Strategic Imperative

BCSC is the only Victorian manufacturer in a growing market. The old plant was capacity constrained and required major equipment upgrades.

### The problems/barriers

Cement manufacture traditionally is a high user of energy resources. Gas has been the most common source of energy. Blue Circle Southern Cement has actively sought to reduce its reliance on traditional energy sources, which was the basis for its \$85m upgrade.

**Stage 1** of the project upgrade increased cement milling capacity to 800,000 tpa.

**Stage 2** will increase clinker manufacturing capacity to match milling capacity.

### Summary of achievements:

- \$10m reduction in costs p.a.
- increase alternative fuels up to 70% of natural gas use
- 15% reduction in power consumption
- 40% reduction in nitrous oxide emissions
- 15% improvement in kiln specific fuel consumption
- 40% reduction in maintenance and housekeeping costs in raw material preparation



# for the future

## Pilkington Automotive



In the last few years Pilkington Automotive has commissioned a \$55m state of the art automotive glass processing plant in North Geelong. The company has been located in Geelong for over 65 years and is a market leader in automotive glass. The company is one of three plants in Australia and is part of a worldwide group which supplies over 60 million vehicles annually.

Pilkington automotive uses a waste reduction and minimisation hierarchy of remove, reduce, re-use and recycle.

The company employs extensive benchmarking against the other plants in the group and uses 3 key environmental indicators - electricity, natural gas and water. Progress is monitored by an independent group.

Best Practice is shared widely across the group and is an important means of transferring key learnings between plants, particularly between newer and older plants.

### Challenges/Issues:

- Improving efficiencies
- Reducing costs
- Improving quality and safety through reducing manual handling of glass

### Actions Taken:

The introduction of an automotive glass processing plant has allowed the following:

- More efficient processing through reduced manual handling - Glass handled only once (before upgrade was 19)
- Strong focus on safety management and shop floor training
- Every piece of glass is tracked entire way through the process
- Weekly reporting systems
- Best Practice is shared through the Pilkington group
- Eliminating waste from the manufacturing process through business operation system sheets
- Data collection & measurement of performance against budget is extensive
- ISO 14001 and ISO/TS16949 certification
- Focusing on improving yield and uptime

### Lessons learned:

- Can reduce critical indicators in older plant
- Benchmarking drives business improvement
- Needs to be done in a systematic and consistent manner
- Good data selection is very important
- Needs to be driven by senior management and owned by all staff



### Material efficiency is about "doing more with less"

It is about gaining more value from less input of materials, usually with associated reductions in the use of energy, water, and labour, and reduced capital depreciation and waste per unit of product/value.

More efficient materials use means less waste, greater productivity, and more financial and environmentally sustainable business practices.

### Summary of achievements:

Over the past 5 years the company has reduced significantly a number of environmental indicators while increasing the levels of production.

- ▼ 30% in Carbon Dioxide emissions
- ▼ 39% in waste generated from site
- ▼ 57% in water usage

## NEWS ITEMS

### Hall of Fame-Geelong companies inducted

In a Gala Dinner ceremony in Melbourne, Alcoa and Air Radiators were inducted into the Victorian Manufacturing Hall of Fame. These companies competed against the best in Victoria and came up very well. GMC Executive Officer David Peart said that to know we have some of Victoria's & Australia's best companies in Geelong is a powerful message that helps to create a positive impression of the industry in the community.

With the induction of these two companies, Geelong has 6 companies in the Hall of Fame (an award conferred on reaching a level of excellence through achieving industry awards). Well Done to Alcoa and Air Radiators.

### The Australian Technical College - Geelong

A lot of work and planning has gone into the ATC-Geelong to ensure that the College produces a quality educational experience resulting in high calibre graduates for industry.

The aim for the ATC-G is to take enrolments for building and construction, automotive and engineering in 2007, followed by electrotechnology and commercial cookery in 2008. By 2010, 300 students will be enrolled across the College.

The benefits of the school based new apprenticeship system stems from the student gaining part-time employment while continuing to study for the year 12 certificate.

We are planning to ensure that graduates of the ATC-G will be able to immediately contribute to that company, and be fast tracked to completing their apprenticeship. This approach will have benefits for both ATC-student and employer.

The ATC-G will use state of the art equipment and coursework to equip the student to be able to excel in modern industry.

The possibility of further study is also accommodated under this model, as graduates will be able to consider more opportunities for tertiary study in the future, which has in the past been limited for other apprentices. Young people who may want to complete an engineering degree can still plan for this at some point in the future, however what differs is the timing and experience. In many cases the added hands on experience can greatly benefit learning.

David Peart from the Geelong Manufacturing Council said that the benefits of this system are considerable. Better matching of students with employers will be one significant outcome. Over a period of time students will be able to understand the culture and work environment so that when they finish their secondary schooling they will be starting from a good base. In the past there has been little uptake of School based new apprenticeships across industry. We are confident that the ATC model put together in Geelong offers a more attractive way of entering into school based apprenticeships for both students and employers.

For further information about the Geelong ATC, or to register an interest please contact Tony Cook on 0409 146 020 or via email [tcCook@g-force-recruitment.com.au](mailto:tcCook@g-force-recruitment.com.au)

# Brintons

## Moving toward world's best practice through Benchmarking

In the space of two years Brintons has achieved a 20% improvement in its manufacturing performance levels.

Brintons - a longstanding world leader in woven Axminster carpets established its Australian operations in Geelong in 1960 and now employs around 140 people Australia wide. A privately owned company, Brintons is known for its quality woven Axminster carpet used in commercial and residential installations.

The company has faced recent challenges and tough international competition with a program aimed at taking it to world's best practice.

Brintons Carpets is a bespoke (custom-made) manufacturer to customer requirements.

The company designs and manufactures to niche markets like casinos, luxury cruise ships, airports, hotels and landmark projects such as the Sydney 2000 Olympics, the MCG refurbishment and the highly acclaimed Melbourne Airport Commonwealth games running track carpet as well as producing beautiful residential carpets in a variety of colours and styles.

With import tariffs continuing to be reduced to 5% in 2010, the challenges of competing with low cost imports and alternative flooring products remains. In response, the company introduced the BEST (Brintons Excellence through Structure & Teamwork) initiative which began in 2003.

The importance of teamwork and developing the organisational maturity to lead, accept and adopt changing cultures required for sustainability has been paramount. Brintons has an environmental policy that both guides and reinforces the company towards environmental excellence.

In this respect, waste management and waste minimisation is one of the many areas that the company is determined to improve.

### Challenges/Problems:

- Imported carpets
- Alternative Flooring
- Need to reduce costs

## Brintons

### The Process

Employee suggestions led to a number of initiatives such as an emphasis on recycling of waste and by-products and improvement in safety and efficiency of the workplace.

### Actions Taken

Empowerment of teams to make changes to their work environment.

Benchmarking team establishment.

The company is now firmly focused on moving closer to world's best practice and expects to see more improvement in coming years confirmed through continued benchmarking with other world class organisations.

### Recycling system

- Separation of all waste cardboard, plastic and yarn are in place and material recycled wherever possible.

### Culture change

- By looking internally, Brintons was able to identify gaps in communication. Now through culture change the sales and manufacturing departments communicate regularly and all the workforce are regularly briefed on business performance.
- Regular benchmarking activities (e.g. tours to other companies) gives the opportunity to view successful cultural changes thereby increasing the success of implementing them internally.

### Summary of Achievements

The plant has seen a 20% improvement in two years of benchmarking.

Brintons is actively pursuing alternative uses and markets for 28,000kgs of shearing waste. It has also diverted significant quantities from landfill by recycling, sorting and separating this waste stream.

Brintons conducts ongoing audits of its waste streams and is now recycling 7 of its 11 waste streams.



## MEMBERS

### Patrick McCaffrey (chairman)

Chris Mawson  
Derek Lipka  
Peter Waller  
Mick Hermecz  
Jenny Purdie  
Tony Dalton  
David Sykes  
David Sinclair  
David Stannard  
Stuart Peace  
Tony Mayer  
Peter Hodgson  
John Paxton  
Brendon Boyd  
David French  
Alan Holley  
Tim Gooden

### G-Force Recruitment

AGB Group  
Air Radiators Pty Ltd  
Alcoa Australia Rolled Products  
Alcoa World Alumina Australia  
Alcoa World Alumina Australia  
Australian Industry Group  
Backwell IXL  
Basell Australia  
Basell Australia  
Brintons Carpets  
City of Greater Geelong  
Deakin University  
Geelong Technology Precinct  
Ford Motor Co. of Australia  
Ford Motor Company of Australia  
Ford Motor Company of Australia  
Geelong & Region Trades & Labour Council

Mike O'Brien  
John Garrett  
Grant Sutherland  
Gunther Flaton  
Geoff Charnley  
Mark Crittenden  
Simon Westaway  
Lindsay Black  
Richard Goldsack  
Brendon Lane  
John Moreno  
Carl Brial  
Robert Learey  
Mark Kershaw  
Alan Greaves  
Jodi Manion  
Lindsay Ward  
David Peart

G-Force Recruitment  
Godfrey Hirst (Aust) Pty Ltd  
Gordon Institute of TAFE  
Hendersons Automotive Technologies  
Huyck Australia Pty Ltd  
Industrial Control Technology  
Jetstar  
Melba Industries  
One Steel - Bekaert  
Pilkington Automotive  
Pilkington Automotive  
Incitec/Pivot Limited  
Powercor Australia  
Rohm & Haas Australia  
Shell Refining (Aust.) Pty Ltd  
Telstra Country Wide  
Toll Geelong Port  
Geelong Manufacturing Council

# Sustainable Manufacturing

## Backwell IXL

Backwell IXL is a privately owned Australian Company, with 200 employees and an annual turnover of around \$40m. The company was established in Geelong in 1858, repairing wood stoves and gold mining equipment, progressing in the 1900's to making stoves. The company currently produces a range of appliance products, heaters and its famous top seller, 'IXL Tastic' range, automotive stampings and foundry products.

The company has a range of equipment including pressings 8-600 tonne and a 400t transfer press.

### Challenges/Problems

Challenges for the company are similar to many Australian manufacturers and include: cheap imports, globalisation, material and labour processes and cost reductions required by major customers.

The company has found that lifecycle design has provided significant advantages and they must be genuinely globally competitive in what they do. They believe the future is dependant on new products, re-engineering existing products, exports, automation, and achieving lower costs from continuous improvement.

### Process Change:

Reduced material handling and improved yields. Savings of \$66,000 per annum.

### Life Cycle Assessment:

Improved service life of consumable component, by factor of 3, resulting in significant savings to customers.

### Handling Decisions:

Automation has lead to elimination of manual handing on a particular heavy product. This has resulted in considerable cost savings and safety improvements.

### Emphasis on Quality

Backwell IXL has achieved significant Quality accreditations, such as ISO 9000-2000, QS 9000, ISO14001 and continues to adopt new standards of the day.

### Guiding Philosophies

Visual - if it looks good it is, productivity - just do it, customers give them value, people most important.

Benchmarking e.g other foundries, suppliers, customers, best practice visits (GPMEN).

People Road Map - Working groups, pride/ownership, attendance, discipline, training, rewards & communication.

### Summary of Measurable Outcomes

Electricity	▼ 11%
Chemical binders	▼ 20%
Sand	▼ 5%
Sand disposal costs	▼ 67%
Scrap metal	▼ 48%
Absenteeism	▼ 20%

- Lost time injury rate decreased
- Inventory rates reduced

### How the company meets challenges:

- Continuous Improvement
- Toyota production system benchmarking, 5S teams, KAN BAN, process management, performance measurement
- Use of KPI boards
- 5S teams-visual displays

### Waste Management

- Streamlined use of waste sorting and skips to minimise waste
- Re-use of foundry sand
- Reducing waste to landfill
- Use press shop scrap metal
- Recovering castings from customers
- Increase material yield
- Product re-engineering to minimise sand usage
- Longer life castings



for the future

# Alcoa Australia Rolled Products

Alcoa Australia Rolled Products



"Our sustainability goal is to simultaneously achieve financial success, environmental excellence, and social responsibility through partnerships in order to deliver net long-term benefits to our shareholders, employees, customers, suppliers, and the communities in which we operate"

## Summary of business activities:

Alcoa ARP was established in Geelong in the 1960's and is the largest supplier of Aluminium rolled products to the Australian market. It operates Rolling mills at Point Henry (Geelong, Vic) and Yennora (Sydney, NSW) with a combined capacity of 200,000tpa, with 790 direct employees & total spending in Australia of \$180m & exports of \$306m.

Alcoa ARP also operates the largest aluminium remelting (55,000tpa) facility in Australia.

## The process:

Casting aluminium slab for rolled products generates significant quantities of dross (a by-product). In order to retain a competitive position in the marketplace and remain in business as a preferred industry in the community, Alcoa ARP needs to derive maximum benefits from dross processing as well as minimise the impact on the environment.

In addition to the significant amount of dross, Alcoa's Point Henry operations was also sending 36,000 tonne of general waste to landfill in 1991.

The company has been strongly driven by principles of environmental stewardship and waste minimisation and these have driven its efforts to improve.

## Actions Taken:

As part of Alcoa Victorian Operations' Waste Minimisation efforts, a team was established at Point Henry to look at ways of reducing waste, conserving resources and reducing pollution.

Dramatic reductions in waste generation were achieved in the early part of the waste minimisation program.

This included the establishment of a Material Recovery Facility in 1997.

## Dross Management

Process changes were made to reduce the overall dross generation and practice changes were made for the reduction in removal of prime Aluminium from furnaces.

## Improved Molten Metal Recovery

The process of immediate in-house molten metal recovery eliminated the need for re-melting, resulting in lower gas consumption and melt loss.

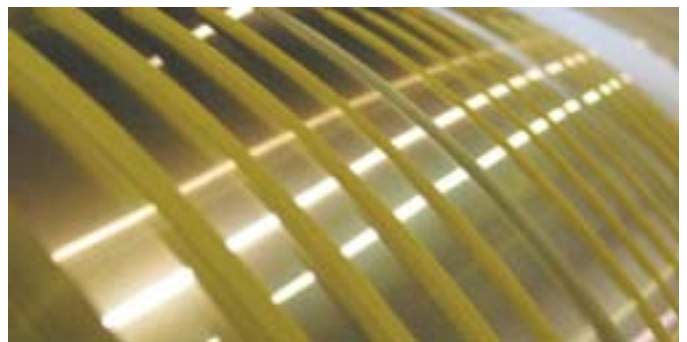


## Reduction of waste to Landfill

Waste to landfill was reduced by 21 tonnes per week (a reduction of 29%), equating to 1100 tonnes per year.

A reduction of the total solid waste from 36,000 tonnes in 1991 to 371 tonnes (169 tonnes of General Waste plus 202 tonnes of Prescribed Waste) in 2004.

Alcoa ARP, through their commitment to sustainability was able to decrease dross generation and total waste to landfill while increasing aluminium recovery.

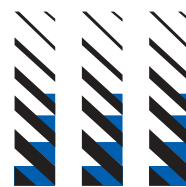


## They achieved this with:

- the adoption of best practice principles
- the use of technological improvements
- by improving efficiency and resource use leading to an increase in material recoveries and a decrease in waste
- and with open consultation with stakeholders.

## Benefits achieved:

- Reduced Dross Generation
- Reduced energy consumption
- Reduced transportation costs
- Reduced Melt loss
- Reduced landfill costs and associated environmental costs
- Increased opportunity for converting waste into a saleable product
- Increased Government support and Community recognition



GEELONG  
MANUFACTURING  
COUNCIL

Geelong Manufacturing Council  
PO Box 638, Geelong  
Ph 5223 2999 Fax: 5221 2914  
Email gmc@tpg.com.au

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