

Vacuum drier proves its worth in more ways than one

AXIAM PLASTICS
concept >>> component

It saves energy, space and time.

It's hardly surprising, then, that just a few months after taking possession of New Zealand's first resin particle vacuum drier Frank Oskam is keen to buy more of them.

The General Manager of Axiam Plastics in Wanganui admits he was sceptical when he first heard the claims being made about a new energy efficient vacuum drier, especially designed for the plastics industry.

"I saw the driers for the first time at the K Plastics Fair in Dusseldorf in 2004, but the claims they were making were almost too good to believe," he says.

The \$35,000 price tag was off-putting too.

"I wanted to try one but I was a bit cautious about it, especially as I didn't know of anyone else in New Zealand using them."

But having watched the drier in action since it arrived at his factory in February all his doubts are gone.

The drier, which is used to remove moisture from plastic granules before they are melted and moulded into shape, is three times more energy efficient than its predecessor. It is expected to cut Axiam Plastics' electricity use by 18,900kWh a year – a saving of almost \$4,000 annually.

And that's not its only advantage.

"It's smaller than the old-style driers so it takes up much less floor space," says Mr Oskam. "And because it dries the plastic granules much faster we only need one machine instead of two to keep the supply of plastic up."

He says the new drier has been so successful that the company will eventually replace its remaining 10 old-style driers with five or six vacuum driers. And he says based on his experience he would recommend the drier to other plastics factories.

"I'm sure other factories could learn from it," he says. "It has certainly changed my mind on our future purchasing plans. It is our intention to replace the others and to ultimately phase them out."

About Axiam Plastics

Axiam Plastics is located on the banks of the Wanganui River. It uses plastic and reaction moulding technology to produce approximately a thousand different plastic parts, many of them for New Zealand exporting manufacturers.

They include the moulded plastic seats used on Formway Furniture's award-winning Life Chair and 17 tiny plastic parts used in Methven's innovative Satinjet Hi Rise Shower. The company also makes the plastic covers for the "Manpack" trancivers made by Australian communications giant Codan.

Among Axiam Plastics' smaller lines are the yellow plastic kicking tees used by All Blacks Daniel Carter and Luke McAlister.

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The business case

Like all New Zealand plastics companies Axiam Plastics imports plastic granules which it then melts and shapes using injection moulding machines.

Most plastic granules absorb water during storage, and they have to be dried before they can be processed. Drying using traditional desiccant driers accounts for around 15% of the total energy used in plastics processing.

However, Axiam Plastics, which has achieved an ISO14001 environmental management standard, is committed to working in ways that are as environmentally sustainable as possible. That includes reducing energy use.

“The cost of energy isn’t going to go down – it’s going to go up,” points out Mr Oskam.

Despite his initial scepticism, he decided to give the new energy efficient vacuum drier a go.

“We needed a new drier, and I had to decide whether to stick with what I knew or try something new.”



The resin particle vacuum drier in operation. The dried plastic granules are transferred by vacuum loader to the injection moulder behind.

He successfully applied for a grant from the Energy Efficiency and Conservation Authority (EECA) to help pay for the new Maguire-brand drier.

The investment has more than paid off. Monitoring carried out for EECA by Energy Solutions in February has confirmed the new drier’s energy efficiency. It found that the new drier was 300% more efficient than the desiccant drier it replaced. It used only 0.1kWh of power to process each kilogram of plastic granules, compared with 0.3kWh for the desiccant drier.

Assuming the drier is used to process 97,200kg of plastic granules a year that amounts to a saving of 18,900kWh or \$4,000 worth of electricity a year.

Comparison of electricity use by desiccant and vacuum driers:

	Hours in use	Electricity use (kWh)	Amount processed (kg)	Electricity use (kWh/kg)
Desiccant drier	91.5	178.3	606	0.294
Vacuum drier	49.5	200.9	2025	0.0992

Source: Energy Solutions

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How does the drier work?

Until recently Axiam Plastics has dried all its plastic granules in desiccant driers.

These work by removing the moisture from air using beds of desiccant beads. The dry air is then heated and passed through a hopper full of plastic granules, where it absorbs the water from the granules.

The process is both time consuming and energy intensive. It takes about six hours to dry 50kg of plastic granules. Additional energy is needed to dry the desiccant beads between each use.

The vacuum drier, on the other hand, can dry 50kg of granules in just 40 minutes.

Instead of using desiccant beads the plastic granules are poured into a storage canister then vacuum-sealed and heated. The low pressure created by the vacuum means that water evaporates from the granules much faster than it does under normal pressure.

The much faster drying time results in significant energy savings. Additional savings come from the reduced amount of electricity needed to transfer the dried granules to the waiting injection moulder. The new drier does this by vacuum loader rather than using compressed air, which takes a lot of energy to produce.



Axiam Plastics General Manager Frank Oskam holding a newly moulded Life Chair seat.



Life Chair seats coming out of the injection moulder. Axiam Plastics has been making the moulded plastic seats for Formway Furniture since 2005.

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Extra benefits

The vacuum drier is efficient in other ways too. Not only is it much smaller than the desiccant drier it replaced, but it can process much larger quantities of plastic. That means that while it previously took two desiccant driers to process enough plastic to produce 35 Life Chair seats an hour, for example, the same amount of plastic can now be processed using just one vacuum drier.

And because the processing time is so much faster, it makes it much easier to switch from one kind of plastic to another.

“Before, if you wanted to change colour or material you had to wait six hours for the drying process to finish,” says Mr Oskam. “Now it takes only 40 minutes.”



Darrell Sanderson loads plastic granules into a feeding bin, ready to be sucked into the resin particle vacuum drier.

EECA grants

Grants for demonstration projects are available to businesses in energy intensive sectors. Grants of up to 40% of the capital cost of the project are available, with a maximum of \$100,000 for each grant. EECA is looking to support energy efficient technologies that are commercially available but not yet commonplace in New Zealand.

EECA grants are available for businesses from the following sectors: heavy transport fleets, wood processing, basic metals, glasshouse crops, irrigated dairying, irrigated arable crops, food and beverage processing, fishing fleet operation and non-metallic products.

Other businesses where energy is greater than 5% of their total business costs are also eligible.

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CONTACT EECA

For more information on EECA's technology grants and services, call 0800 358 676 or visit www.eecabusiness.govt.nz/eib