

# Clean message

**Ahead of *Machinery's* Environment Matters event next month (see box item), Andrew Allcock looks at recent degreasing technology developments and applications**

**W**ith legislation on solvent use becoming more and more restrictive, Clive Ward, general manager of the Clean-Tek product range at the Wheelabrator Group, reminds industry that there is a ban on trichloroethylene (trike) looming. All solvent-using companies must now have written documentation in place setting out how they will restrict the use of trike in business practice by October 2008, under the requirements of the Solvents Emissions Directive (SED).

Many solvent companies are now offering chemical alternatives, which can appear to be a tempting and quick-fix solution, but companies should be taking a much longer-term approach in researching all potential implications, Mr Ward underlines.

"No solvents can be used in open-air systems, so it is likely that many businesses will have to consider costly

equipment upgrades to use even the replacement solvent cleaners.

"It is also very likely that the EU will further limit the use of replacement solvents; and, with fewer companies using them, the price is sure to increase."

#### FILL-UP COST

And he underlines the cost implications of the quick-fix route, too. "It can cost up to £1,000 to fill a 100 litre tank with a trike alternative such as NPB, however, for the same capacity, companies can expect to pay £12.50 for a full tank of aqueous detergent and water – a fraction of the cost."

Aqueous cleaning is no longer the costly process it once was and is highly effective at removing grease, oil, dust, tar, carbon, dirt and other contaminants, Mr Ward asserts.

They are more environmentally friendly, using 95 per cent water and 5 per cent aqueous, non-hazardous detergent. They don't decompose, unlike many replacement solvents which decompose to release carbon dioxide, carbon monoxide and hydrogen bromide into the atmosphere and working environment.

One company to tread the Wheelabrator route is aircraft part manufacturer Meggitt Aircraft Braking Systems (MABS). It has switched from trichloroethylene to a Wheelabrator spray wash machine.

MABS will use the new multi-stage front loading equipment to degrease complex aircraft parts, used in braking systems, prior to plating and painting. Before investing in the new machine,

## Environment Matters – Talk to up to 20 experts in one day

Degreasing, coolant, air quality and waste disposal are not sexy, but they are issues that all metalcutters/metalformers have to tackle. Legislation is forcing change. Is your company on top of it all? Environment Matters, to be held at the Hilton Hotel, Warwick (J15, M40), on 12 June 2008 (9:30 am – 4 pm), can provide you with the answers to your questions and deliver real cost savings for your company.

Companies already signed up for this established, successful event are: Air Cleaning Systems (air filtration); Arboga-Darenth (coolant management/filtration); IB Industries (cleaning/degreasing); Kitagawa Europe (air filtration); Kyal Machine Tools (cleaning/degreasing); Master Chemical Europe (cleaning chemicals); Turbex (cleaning/degreasing).

Visit [www.machinery.co.uk/environmentmatters](http://www.machinery.co.uk/environmentmatters) to sign up for the FREE event or register your interest.



*Solvent degreasing was chosen by Cold Form Products, Kumi Solutions providing the technology*

MABS used trichloroethylene, more commonly known as trike, as a vapour degreaser.

“During the selection process we invited MABS to run a number of trials at our Surface Technology Centre in Birmingham,” explains Paul Mitchell, equipment sales manager for Wheelabrator. “This enabled us to refine

and agree the exact specification of the machine required and demonstrate the high quality finish of aqueous cleaning.”

But solvent cleaning is far from dead, and its performance still not bettered under certain circumstances, as East London-based Cold Formed Products (CFP) examples.

The company has installed a Pero V1

universal degreasing machine from UK agent Kumi Solutions. Installed in October 2007 – at the end of the production line at CFP’s Plaistow manufacturing facility – the new unit is already cleaning approximately 1 million aluminium ‘impact’ extruded parts a month for a number of automotive and aerospace industry customers.

**UNCONVINCING SOLUTION**

“We first heard about the impending SED legislation three years ago,” says the company’s technical director, David Binks. “At first we thought the best approach would be to try and replace solvents altogether, so we looked at aqueous-based degreasing solutions. But to be honest, the trials we conducted were far from convincing.”

Undeterred, the company refocused its attention on solvent cleaning, but this time Mr Binks and his team examined hermetically sealed systems.

“We visited four of five suppliers of solvent-based sealed machines, but again the results were not impressive. It was only when we spoke to our supplier of solvents that I heard about Pero machines. We later contacted Simon Graham at Kumi and he recommended the Pero V1 machine. After trials in

**Product development**

**Dürr Ecoclean** (Geo Kingsbury) has extended its EcoC Flex cleaning system for heavy duty parts. The new design extends Ecoclean’s flexible robotic technology for precision cleaning to accommodate industrial parts weighing up to 300 kg.

The EcoC Flex system was first introduced in February 2007 and has already been sold to more than 20 automobile manufacturers and suppliers worldwide. Customers in both the bus and truck sectors needed a heavier duty solution and the flexibility and capacity of the new machine also fulfils the special demands for low cycle times found in the

commercial vehicle sector.

The system combines proven cleaning processes, most of which take place in the central multi-functional chamber. A spray system is installed for powerful injection flood washing (power IFW), targeted rinsing and optional high pressure deburring.

Additional equipment for further cleaning processes can be installed at any time. Depending on cleaning requirements, it is possible to mount additional treatment processes on the outside of the multi-functional chamber. General pre-drying of the industrial parts is accomplished by intense air-drying. An optional vacuum drying system ensures 100 per cent drying of all the parts.

**PDJ Vibro** has launched the new ASC50 and ASC70 range of centrifugal drying machines. Ideally suited to mass production operations where components require drying or oil separating, the compact new units can fit into any production environment. They have a tilting load and unload facility that eliminates the need for crane loading, and they have variable speed controls up to 550 rpm for sensitive parts and can cater for components down to 2 mm.

The baskets have a dimension of 460 and 490 mm diameter with a depth of 250 and 320 mm for the ASC50 and ASC70, respectively, with a capacity of 40 and 60 kg, or a theoretical volume of 41 and 60 litres, respectively.



*Honda, Swindon is saving water and time following the installation of an Aqua-Save unit*

Germany we were relieved to find that it did the job very well.”

CFP has developed its own in-house methods for measuring part cleanliness that replicate the procedures used by its customers, to determine whether or not components are sufficiently clean.

According to Mr Binks, one of the differentiating factors in favour of the Pero V1 was its vacuum system that is used to evacuate the chamber of residue. Many competitor systems use a ‘regenerative carbon stack’, which can be a time-consuming alternative. CFP also claims that the V1 was better priced.

Pero machines represent a significant step forward in cleaning technology as the machines are ‘universal’. That is, they employ almost any type of solvent, from chlorinated hydrocarbons – such as trichloroethylene and perchloroethylene, through to methylene chloride, modified

alcohols – such as Dowclene 1601, and any standard hydrocarbons – for example, A3 category products with a flash point in excess of 55°C. A V-Series system can be changed from one solvent type to another in as little as one day.

#### **ALMOST DOWN TO ZERO**

The V-Series machines are hermetically sealed to provide “near zero” emissions and so comply with the new SED. They are run under partial vacuum conditions, thus helping to lower the boiling point of the solvent. This has many advantages such as improved energy efficiency, reduced solvent consumption and the ability to clean more delicate materials such as thermoplastics and coated parts.

Solvent condition is monitored automatically with solids, oil and water separated as part of the process. Sophisticated drying using two or three

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vacuum pumps is also fully integrated. The V-Series machines come in five sizes ranging from a basket-type system with 380 by 220 by 200 mm capacity, up to a Euro pallet size capable of handling a 1,500 kg payload.

Installed in October 2007, the CFP Pero V1 was commissioned (using perchloroethylene) within two days without interrupting production.

"So far it has performed very, very well," says Mr Binks. "We manufacture around 1 million parts a month here and they all go through the Pero. Cycle times are typically 6 minutes, but because of the machine's automatic basket loading system, which accommodates four baskets on the conveyor, the machine looks after itself for 24 minutes at a time. It's a feature we really like."

Depending on the size of component, CFP places between 150 and 2,000 units

in each basket. The machine runs for 10 hours a day, five days a week.

"In total the Pero machines cleans 2.5 tonnes of aluminium a day, which is 25 per cent more than we could do previously," says Mr Binks. "Furthermore, the V1 only requires cleaning once every three weeks, whereas we had to clean our previous open top tank every week without fail – and the process was much more labour intensive."

At the Honda engine plant, Swindon, where aqueous degreasing is employed, the company has made efforts to conserve and reuse the water which is the key component, by volume, of the process. It has installed an Aqua-Save 30 unit supplied by MecWash to complement an existing degreasing set-up.

The unit is enabling maximum use to be made of the wash machine through which some 6,000 petrol and diesel

engines are processed each week. The Aqua-Save design keeps the wash solution clean – in this case from a single aqueous cleaning station – allowing extensive water reusage with only minimal volumes of waste then requiring further handling or disposal.

The ability of the system to help maximise production effectiveness in this way goes to the heart of Honda's reputation, not least its commitment to the highest levels of production quality.

"Before the Aqua-Save unit was installed, we had to undertake weekly changes of wash solution from the manufacturing line," points out a Honda spokesperson. "This volume, some 1,500 litres, could require around four hours' labour to handle with the machine being non-operational for that period. The Aqua-Save unit did not require cleaning in its first 10 weeks of operation." □

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