

Flushing out non-conformers

The Solvent Emissions Directive (SED) is now in force. Does your company comply? Steed Webzell reports

Open-top solvent degreasing tanks now only have a place in history books. The arrival of the SED on 31 October signalled a new dawn for manufacturing companies in the UK, demanding that they have documentation detailing how they would be restricting solvent use.

Clive Ward, general manager of the Clean-Tek product range at surface preparation specialist Wheelabrator Group, believes companies still flouting the new legislation have only until the end of the year before it will become impossible to comply with the ban in

October 2008.

"The SED restricts emissions from organic solvents, such as trike, to limit worker exposure and protect health. It was passed by the EU in 1999 and gave businesses eight years to implement changes. Late last year more than half of the UK's manufacturing and engineering companies using trike were failing to prepare for the SED.

"By giving companies a grace period to make alternative arrangements, the SED has, unintentionally, encouraged firms to leave planning to the very last

Belt and braces

Recently launched in the UK by sole agent Geo Kingsbury is a new tunnel cleaning aqueous system. Called Dürr EcoBelt, it uses either a belt or chain conveyor to transport components through the machine.

Around 40 variants of modular construction allow systems to be configured to support anything from entry-level use to top-end production applications, and the systems can be expanded at a later date by retrofitting additional units. There are four main sizes of system to suit workpiece size and required throughput.

Components can be loaded by hand or the machine can be integrated with a machine tool or production line for automatic feeding of components. Various cleaning processes and conveyor speeds can be programmed using the Siemens control based on single or multiple washing, rinsing and hot air drying cycles.

Announced also by Geo Kingsbury is its appointment to sell an additional range of Dürr Ecoclean machines, namely the automated cells built at the German company's Monschau factory that suit large volume production applications such as those found in the automotive industry. One such system, called EcoCFlex, incorporating a 6-axis robot for component loading and injection flood washing, was demonstrated cleaning a BMW engine block at Geo Kingsbury's Open House in Gosport earlier this year.



Peter Crowther: DebutArt

minute. We have seen a 30 per cent rise in enquiries over the past six weeks alone," he continues. "With such surging demand it's going to be very difficult for all companies to implement plans and have machines installed quickly."

The solvents affected by the new EC regulation are trichloroethylene (trike), methylene chloride, perchloroethylene, n-propyl bromide and HCFC (hydrochlorofluorocarbon), solvents such as HCFC 141b. Everyone must comply – the few temporary exceptions being for the precision cleaning of electrical parts and other components used in aerospace and certain other military applications, for which the ban enters force on 31 December 2008.

The first thought that occurs to many manufacturers is to seek refuge in aqueous washing, and for many this proves a highly advantageous strategy.

A case in point is the Clean Pneumatronic Systems Division of KV Automation in Milton Keynes, which



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manufactures pneumatically operated components. Here, a new MecWash Midi aqueous-based component cleaning machine has replaced the previous solvent-based system.

The full range of pneumatic components – the majority of which are bespoke systems destined for microelectronic, precision measurement and instrumentation applications – are machined off-site before undergoing sub-assembly work within the main factory. From here, components are moved to a dedicated area between the shopfloor and the clean room within which the MecWash system is located. Significantly, the machine itself remains external to this area to ensure that servicing and maintenance procedures do not impact on the clean area.

With blind holes and deep, small bores typical of the complex components, cleaning performance is clearly critical

and Roger Day, senior production engineer for the Advanced Product Division at the company, notes significant performance gains – in terms of reduced failure rate – compared with the previous ultrasonic, solvent-based installation.

"The MecWash cleaning process includes spray/flood immersion wash and rinse stages with a filtration level of 1 micron," he says. "The targets set by the CPS Division – some 1 to 1.5 micron on final rinse – are thus readily achieved."

TRIKE REPLACEMENT

Another company to travel down the aqueous route recently is Stevenage-based Propak Sheet Metal which has just taken delivery of a Turbex AC-2.5 multi-stage degreasing machine. Propak specialises in fine limit sheet metal and fabrication as well as a wide variety of finishing techniques.

The water-based Turbex AC-2.5 multi-

stage machine replaced a trike system and provides the benefit of phosphate coating as well as degreasing. It was selected by Propak following evaluation at the Turbex Technology Centre, where process development trials were performed. This compact single cabinet unit allows all five process stages to be carried out automatically in one chamber.

The machine incorporates three integral heated tanks with a closed-loop process to minimise heat and chemical losses. This, together with the 50 mm mineral wool insulation to the chamber and the tanks, minimises electrical consumption for cost and efficiency purposes. All the processes, including cold rinsing stages, can be independently set within the programme so the whole process can be optimised.

Turbex also provided water treatment plant to minimise rinse effluent and to deionise the water in the final rinse.

As the SED is European legislation, it also applies to the 27 member states of the EU, including Hungary, where Guyson has recently installed a versatile four-stage conveyerised Marr-Line tunnel washer into an automotive component manufacturing factory. The new washer allows a range of brass, aluminium and iron starter motor parts to be completely degreased of oil, grease and shop dirt, and provides a protective rust preventative coating at the same time.

STILL NEED SOLVENTS?

For a variety of reasons, some manufacturers declare a preference to remain with solvent cleaning. This is perfectly legal, provided the solvent is not allowed to escape into the working environment. One such company is Blackburn-based Presspart, a specialist in deep drawn precision pressings for automotive and pharmaceutical customers. In direct response to the SED, Presspart opted to install a Höckh multi-stage hermetically sealed perchloroethylene degreasing system supplied by UK distributor IB Industries.

"We were faced with the reclassification of trichloroethylene, as well as increasing solvent and labour costs associated with degreasing parts in ageing cleaning plant," explains Arnold Wilkinson, Presspart process manager. "Furthermore, growing demand from customers to provide high levels of particulate and residue cleanliness meant that the old processes could not compete with the new technology available."

Running at up to eight loads per hour depending on the wash programme, the Multi clean system has allowed Presspart to degrease and clean a cocktail of contaminants from a mix of 120 different parts with 30 types of geometry and up to 15 different materials, with a series of filtered circuits coupled with an efficient combination of spray, rotation, immersion and ultrasonic capacity.

"The new Höckh plant in the lean manufacturing cell has revolutionised our manufacturing process, as all parts are cleaned immediately after pressing rather



Harwin's monthly solvent bill of £800 has been slashed to £800/year with a Pero unit

than remaining in an oily state for long periods," continues Mr Wilkinson. "Keeping parts in an oily condition leaves them susceptible to staining and makes them difficult to store. Within weeks of commissioning the Höckh machine, the entire backlog of oily work-in-progress had been eliminated."

Elsewhere, Harwin is an example of how doing the right thing environmentally – in this instance by investing in a Pero V0 Universal solvent degreasing machine – can have a very positive effect on the bottom-line.

Emily Gower is an R&D Engineer at Harwin, an electrical and electronic interconnect solutions provider, where she played a key role in the installation and commissioning of the company's new Pero V0 Universal solvent degreasing machine. She explains: "Every stage of our manufacturing process is continuously scrutinised to ensure that we maintain the highest standards, both in terms of production quality and our environmental responsibilities. We planned our response to SED legislation well in advance because solvent cleaning is a vital step in the production process for our electroplated parts."

Before the investment in the new machine, Harwin cleaned its components using a standard solvent dip tank which required solvent changes at frequent intervals and usage many times over the volume threshold requiring SED compliance.

"Since installing the Pero unit, we've been able to drastically reduce the amount of solvent used: effectively operating a closed-loop solvent recycling process for months at a time," Ms Gower adds. "From a previous spend on solvents of around £800 per month we anticipate spending no more than £800 in total over a full year of using the Pero machine. This includes safe disposal of used solvent at the end of its life. Hard, financial proof that doing the right thing for the environment can also be a good business opportunity. We have also reduced the man-hours required for degreasing and the load on the downstream electrochemical clean."

NO QUICK-FIX SOLUTIONS

Wheelabrator's Clive Ward has some final advice. "I urge firms to think beyond profit margins and avoid the trap of solvent swapping. Many solvent companies are now offering chemical alternatives: a tempting, quick-fix solution. However, these come with their own long-term implications. No solvents can be used in an open-air system, so it is likely that many businesses will have to consider costly equipment upgrades anyway. The EU is continually recommending measures to reduce the use of solvents, and with fewer companies using them, the price is sure to increase.

"On top of cost barriers, managers need to consider employees' health and safety. Exposure to solvents is highly dangerous and is one of the reasons the SED was introduced. Potentially cancer-causing metal degreasers such as trike contribute to almost a third of industry deaths; so as well as hefty fines from the HSE, firms may be hit by increasing compensation claims for associated health problems." □