

'Washing day' looms

With 31 October, the Solvent Emissions Regulations 2004 applications deadline looming, Steed Webzell presents a clean sweep of the latest washing and degreasing developments

While the 31 October 2006 applications deadline for Solvent Emissions Regulations (SER) 2004 compliance licences (see page 100) ensures that usage of open-top trichloroethylene ('trike') systems will continue to decline, opinions on effective alternatives are divided. Some companies are fully committed to the adoption of aqueous systems, sometimes partly assisted by ultrasonic units, while others remain resolutely with solvents, selecting either alternatives to trichloroethylene or hermetically sealed systems.

Naturally, each system manufacturer/vendor is promoting the effectiveness of its own particular range products, but most will also offer the reassurance of extensive trials to establish that the required cleanliness levels required can be

attained for a particular application.

"These days, manufacturers are looking for aqueous cleaning machines capable of meeting tight cleanliness specifications for precision components," says Simon Hancock, managing director of Turbex. "Solvents are being increasingly ruled out in favour of aqueous systems because of solvent costs and the problems presented by current and future legislation arising from environmental and safety regulations."

Mr Hancock says that it is usual for multi-stage aqueous systems to include washing and rinsing processes, and sometimes hot air drying after the final rinse. In the case of spray wash machines, external or immersed washing and rinsing processes are followed by hot air drying – all carried out sequentially in a single chamber – helping to keep the machine footprint as small as possible.

For multi-stage ultrasonic machines, Turbex has developed TurboSonics, a cleaning process that combines ultrasonics, vertical agitation and submerged jets – all programmed to provide cleaning in each wash tank. When necessary, the parts are rotated in a basket or fixture, while the wash fluids are filtered continuously to ensure they remain free from contaminants.

Rinse tanks may provide air bubble agitation for the best effect. The final rinse may also be with deionised water operating on a closed-loop system with cartridges to remove any chemicals that might remain after the first rinse process. This ensures that

the required cleaning standards are achieved and that components have a stain-free finish.

Due to evolving legislation and the standards of component cleanliness demanded, new models are developed aggressively in what has become a highly competitive technology sector. To celebrate its 90th anniversary, Ransohoff (DG Holmes Engineering) has recently added the two-basket Lean-Jet rotary parts washer to its range of cell cleaning systems. The Lean-Jet RB-2 is part of the new 'right sized, right priced' industrial duty, aqueous-based component cleaning line, and consists of multi-stage rotational cleaning, rinsing and drying in a common chamber, eliminating the need for a part transfer system.

DEDICATED EQUIPMENT

Driven by the European Solvent Emissions Directive, Mike Speak, general manager at Wheelabrator Group, also sees a trend towards aqueous systems in specialised industries such as automotive, aerospace and medical which require dedicated equipment to meet exacting specifications. But, according to Mr Speak, cleaning with water is no longer the costly process it once was, with a varied selection of rinsing, degreasing and washing equipment now available.

The latest additions to the Clean-Tek range from Wheelabrator, for example, are the SB300 and SB400 rotating spray and flood-wash systems, designed especially for metal parts washing, degreasing and drying in small-to-medium batches. The machines have been developed to allow easy processing



The Surface Alliance equipment portfolio, managed by Chiron UK, takes in four companies each with a different focus



Birmingham-based Hydraforce is using MecWash aqueous washing machines featuring ultrasonics as part of the cleaning process for complex hydraulic valves – six separate component designs are cleaned including a new transmission manifold

of small items, including turned parts, pressings, stampings, forgings, extrusions, machined castings and similar components.

Master Chemical says that while the growth in the use of aqueous washing fluids is certainly legislation driven, its customers want high performance from these products not just compliance with health and safety regulations.

Aqueous parts cleaning machines now utilise ultrasonic agitation and high-pressure sprays in order to achieve required cleanliness. Master Chemical's R&D emphasis, therefore, has been on

the introduction of very low foam, ultrasonic compatible fluids that can be used in multi-stage washers. An example of this new breed is a foam-free, high-pressure spray-washing compound that can also be used for deburring and waterjet cutting. Trim Clean 2115 employs advanced surfactant technology that releases tramp oil to the surface extremely quickly and will even split emulsified coolant. The net result of this action is long sump life.

The development of phosphate-free washing fluids has been another priority for Master Chemical. Due for launch in

the UK later in 2006 are two new products in this category: Trim Clean 2025NP, for two- or three-stage spray washing; and Trim Clean 2229NP that combines high-pressure spray washing and immersion tanks.

LIKE CLEANS LIKE

Anyone paying attention in chemistry lessons will remember that 'like dissolves like', which is why chlorinated solvents are used to clean oil and grease from machined components, and water is able to flush away salts and other water-soluble matter. Problems arise, however,



It is usual for multi-stage aqueous systems to include washing and rinsing processes, and sometimes hot air drying after the final rinse, says Turbex

when using modern, high-additive cutting oils that comprise a mixture of solvent-based and aqueous constituents.

To address this area, Dörr Ecoclean has teamed up with Dow/Safechem to introduce a new cleaning system. Called the Compact 80P, it harnesses the experience of the former in industrial cleaning machine technology and uses the latter's newly-developed Dowclene 1611 cleaning solution. Apart from being a good degreasant, the non-corrosive solution is also effective in removing water-based soil and oil-water emulsions as well as particulate matter, and dries without leaving a residue. Sole UK agent, Geo Kingsbury Machine Tools, points out that the new equipment will help manufacturers to address the forthcoming stringent EU legislation on volatile organic compounds (VOCs).

Aqueous component cleaning equipment from MecWash Systems has now taken another step forward in a move that is of particular importance to manufacturers of complex machined products. The company's rotational washing system is now available with ultrasonic cleaning built in to the same unit to provide even higher levels of component cleaning.

By combining the two technologies, MecWash is able to extend the quality of its cleaning processes, allowing manufacturers to gain from a choice of cleaning processes from single-chamber MecWash Systems equipment.

To date, MecWash Systems has focused on adding an ultrasonics capability to the two units in its range – the Midi 400 and the larger Millennium system. Exemplifying the use of this enhanced MecWash technology is Birmingham-based Hydraforce which uses ultrasonics as part of the cleaning process for complex hydraulic valves – six separate component designs are cleaned including a new transmission manifold for a leading manufacturer of construction equipment.

SOLVING SOLVENT ISSUES

While cleaning with solvents remains the first choice for many manufacturers, the concerns surrounding the use of halogenated substances such as trichloroethylene has led to the birth of a large number of alternatives.

Many machine vendors in the degreasing technology sector have been busy developing processes that optimise the use of these new substances. One company that has risen to the challenge is SIS Chemicals which offers three degreasing processes based on the use of the environment-friendly New Era range of solvents. These contain Purasolv lactate esters that are derived from sugar

beet and provide high cleaning performance in a variety of systems. Each process has been developed in conjunction with SIS Chemicals' equipment partner CC Hydrosonics, in response to growing demand for effective solvent/process combinations that meet the requirements of SER 2004 and the reclassification of certain vapour degreasing solvents.

"Our new degreasing options remove the concerns that surround halogenated solvents, give excellent performance and allow for a variety of process variations," says Barry Eaton, sales director at SIS Chemicals. All three process options use Purasolv as the primary degreasing solvent; enhanced vapour degreasing (using Purasolv EHL and Forane 365HX); modular immersion (using Purasolv EHL and Purasolv EL); and enclosed immersion (using Purasolv EL).

Disposal of Purasolv is by incineration leaving CO₂ and water as decomposition products, the feedstock for the sugar beet from which Purasolv is produced. Purasolv grades are also biodegradable so groundwater issues associated with solvent are not a problem.

Many suppliers of washing and

Act now to obtain a licence

Operators of Volatile Organic Compound (VOC) systems must act now to obtain a licence if they are to avoid penalties and restrictions on operations. That is the warning from surface cleaning specialist Virotec following a surge in enquiries from VOC users seeking compliant degreasing systems ahead of the licence application deadline of 31 October 2006.

"All users of VOCs must be operating under licence in compliance with the UK's Solvent Emissions Regulations (SER) by 31 October 2007," says Virotec's business development manager, Ian Lucas. "However, due to the expected high demand, the regulators require that operators of VOC systems apply for a licence under IPPC by 31 October this year."

Mr Lucas adds that the regulators intend to avoid issuing conditional licences wherever possible, and hence are expecting applications to be based on compliant operations being in place and proven at the time of application. This means that operators of VOC systems need to act now to ensure they have licence compliant systems in time. (Mr Lucas will be speaking about this issue at the free-to-attend, limited-places MACHconsult seminars at MACH 2006 – visit www.machinery.co.uk/machconsult and book your place today).

degreasing machinery now opt to supply both aqueous and solvent-based systems. A recent entrant to the market, is the Engineering Technology Group which has been appointed the sole UK representative for The Surface Alliance, a global industrial component cleaning specialist. The Alliance comprises four companies: LPW, which focuses on aqueous systems; EMO, which focuses on solvent-based systems; Hoesel, which offers special purpose solvent-based systems and installations; and Mecanolav, which offers custom spray cleaning systems using aqueous media.

Richard Blake, managing director of Chiron UK, takes responsibility for The Surface Alliance portfolio and has appointed industry expert Helmut Dehnert as UK sales manager for the products. Mr Dehnert says that the growing need for this type of equipment

in the UK is being driven by two key factors. "Firstly, the automotive and aerospace industries, and indeed the turned and milled parts industries are, in general, demanding cleaner parts from their own production and from their sub-contractors," he says. The second factor driving this need is the forthcoming SER legislation.

Another supplier fitting this mould is IB Industries which offers hermetically sealed solvent degreasers, ultrasonic and 100 per cent solvent-free systems.

IB represents both EVT and Höckh hermetically sealed systems in the UK. Machines such as the EVT Gigant and the Höckh Multi-Clean 1-4F come with a solvent concentration measuring device offering below 1 g/m³ that guarantees compliance with the solvent emissions directive and the European VOC regulations.

IB also offers Elma ultrasonic cleaning systems as well as Mafac brand products which offer 100 per cent particle and solvent-free operation. The Mafac equipment ranges from cell-based wash systems to purpose-built standard equipment, typical applications being the cleaning of hydraulic blocks for Bosch Rexroth in Glenrothes, or the cleaning of pressed parts for filter manufacturer Clarcor in Warrington.

With the SER 2004 deadline looming on 31 October 2007 (and applications for licences due by 31 October this year), washing and degreasing has, more than ever before, become a critical issue for manufacturers across the UK. Many have taken action; for those that have not, the message is: "act now". □

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