

Trike tribulations

Anyone thinking trichloroethylene (tri-ke) is banned, is wrong. Simply by controlling the risks manufacturers are legally free to continue using this high performance solvent. Steed Webzell reports

With all of the publicity surrounding the introduction of October's Solvent Emissions Directive (SED), it would be easy to think that the death knell for trike has well and truly sounded. And yet this could not be further from the truth; or so a Safechem Europe seminar in Warwick emphasised.

"We wanted to communicate that for essential uses in metal cleaning, trike can and should be used where substitution is not practical," says Richard Starkey, UK team leader – technical sales at Safechem, a wholly owned subsidiary of the Dow Chemical Company.

First to the microphone was Martin

Leach, a technical adviser with the Environment Agency's Local Authority Unit, who was on hand to explain the key legislative facts set out in the SED.

"Article 1 of the SED defines the cleaning activities and solvent thresholds that now apply, while Article 4 lists the compliance dates, which have now passed," he says. "In light of this, all applicable manufacturers performing component cleaning should have a permit and be compliant. Article 5, Paragraph 6, lists the requirement to replace materials assigned or carrying risk phrases R45 [which includes trike], R46, R49, R60 and R61."

While it all sounds clear enough so far, Article 5, it appears, also permits the opportunity for derogation which, according to Mr Leach, "clouds the water to a certain extent".

Statements within the paragraph (and here is the bone of contention) such as "substituted where possible" and "in the

shortest possible time" are open to interpretation and make it possible to legally justify a case for the sustainable use of trike.

"The preferred option of the Environment Agency is to substitute listed chlorinated solvents with non-risk phrase materials in the shortest possible time," says Mr Leach. "However, although it is not encouraged, where a viable alternative is not available, a technical and economic justification for derogation can be put forward providing the solvent consumption threshold stated in the SED [1 tonne per annum] is not exceeded."

THE END FOR 'OPEN TOPS'

The 1 tonne per annum consumption limit is crucial as this does in fact mean that traditional 'open top' degreasing systems that utilise trike are no longer acceptable because the process cannot physically meet such a small annual consumption target. The exclusion of the



REACH for compliance

Aside from the SED, perhaps the only other legislative factor to bear in mind concerning the sustainable use of chlorinated solvents such as trike is REACH (the registration, evaluation, authorisation and restriction of chemicals). Dr Markus Frank, a member of Dow Deutschland's REACH commitment team talked at length about the Voluntary Industry Commitment (VIC). Europe's three solvent manufacturers, Dow Europe, INEOS Chlor and Chimcomplex SA Borzesti have all committed to the VIC, which comes into effect on 31 December 2010.

"The VIC comprises two phases," said Dr Frank. "Initially we are concentrating on REACH awareness and marketing the relevant information, but after 31 December 2010 we will refuse all sales of chlorinated solvents such as trike to open system applications."

Any manufacturers concerned about the impact of REACH can visit www.reach.dow.com.

process is largely the underlying reason why so many manufacturers have also sought alternative cleaning media. And yet this thinking of replacing an excellent degreasing solvent such as trike with the next best option is seen as 'blinkered' by many, including Safechem's Richard Starkey.

"In terms of substituting trike, we see it as short sighted to accept the second best solution," he says. "Hence, the challenge is to manage the risk and continue using trike, albeit in compliance with the SED."

The simple reality is that trike excels at component degreasing and removes effectively all kinds of contamination, including coolant, oil, grease, emulsion, polishing pastes, soldering flux, fine particles and fingerprints. Trike is also non-flammable, has low surface tension, high drying speed, can be recycled easily by distillation, leaves no residue, performs universally well on all substrates and, ultimately, is very cost efficient. Unsurprisingly, therefore, Safechem says that many of its customers have found suggested alternatives unable to match the performance of trike.

Among these is Bodycote, a heat treatment company with nearly 200 plants around the world. Like most businesses operating in the manufacturing sector, Bodycote commenced a process to identify a trike alternative, examining three substitutes along the way: aqueous, hydrocarbon and alternative mediums.

"Aqueous proved to have a number of drawbacks," said Bodycote's Terry Hill in his presentation, 'Trike – Removal or Control?' "Energy consumption is high due to the fluid heating phase, it has difficulty cleaning small holes effectively, it's not acceptable for some of the materials we process and disposal of contaminated solution remains a burden."

Bodycote also found hydrocarbon solutions to be unacceptable to a number of its aerospace customers and additionally exhibited long cycle times due to the amount of process distillation. What's more, the flammability of



Pressed parts makers like trike: left – Pero at Cold Formed Products; above – Höckh at Pressparts

hydrocarbons renders them an unnecessary risk for a heat treatment company. As for alternative mediums, Bodycote considered both methylene chloride and perchloroethylene.

"Methylene chloride performed well, but could not match trike due to its low 40°C boiling point, while perchloroethylene still has limited aerospace approval," said Mr Hill. "So our final conclusion was that none of the trike alternatives proved acceptable to Bodycote or the company's customers."

Like many manufacturers in a similar predicament, the way forward for Bodycote has been to invest in totally enclosed solvent-based systems. "Control works for us and we hope this will continue," he said.

UNIVERSAL MACHINES

The ongoing demand for trike from companies such as Bodycote is supported by degreasing machine manufacturers such as Pero, which supplies both solvent and aqueous-based systems, with the former commanding 65 per cent of sales.

Pero, which had a strong presence at the seminar through its UK agent Kumi Solutions, is enjoying particular success with its universal machines. These have the ability to make use of both chlorinated solvents such as trike and

alternatives like (A3) hydrocarbons. yet if trike is OK, why a universal machine?

Among the many possible answers to this question are: changing end user demands; internal company policy changes; the potential development of better solvents; the requirement to degrease temperature sensitive materials; and even another change in legislation.

Yes, although the fallout from the SED has yet to settle, it's not inconceivable that several years down the line another change to environmental policy will ultimately outlaw all use of chlorinated solvents such as trike. If any of these eventualities materialise then a universal machine means that only the solvent will have to be changed, not the machine, hence protecting the investment.

Other suppliers such as EVT and Höckh (both represented in the UK by IB Industries), also gave presentations at the seminar promoting the virtues of hermetically sealed solvent-based systems. The use of these machines reduces significantly both the quantity of solvent lost to air and waste (to well within the SED's annual solvent consumption limit), as well as the amount input to the system. Safechem says that these advantages can be boosted further through the application of chemical product services. □