

Solutions

Issue 2 • Spring 1998

News from the European solvents industry

MEPs vote on solvents VOC directive

The proposed VOC Solvents Emissions directive completed an important phase this January: first reading in the European Parliament.

FOLLOWING a majority vote of the European Parliament's Plenary on 14 January 1998 the proposed directive completed its first reading by the European Parliament and is on to the next stage – consideration by the Council of Ministers.

The directive will affect 30 sectors encompassing more than 400 000 solvent users and calls for an average VOC emission reduction of 69 per cent.

"The solvents industry welcomes legislation for environmental gain – as long as it makes economic sense economically – to build further on existing environmental achievements"

To help answer some MEPs' questions about the directive, the European Solvents VOC Co-ordination Group (ESVOCC), a cross industry forum representing solvent producers and users, met with leading industry and legislative figures in Strasbourg on 16 September 1997.

Dr Ian Dobson, ESVOCC Chairman, joined Parliament Rapporteur Professor Cabrol MEP, Economic Committee Rapporteur Mr Rübig MEP and David Bowe MEP, who is following the issue on behalf of the Socialist Group, in a panel discussion. The seminar was also attended by other members of ESVOCC; assistants and political group staff from the European Parliament; Member State officials and European Commission representatives from DGXI.

The discussion addressed two key

issues: the environmental objectives of the proposed legislation in the context of reducing ground level ozone levels and its impact on solvent-using industries.

David Bowe MEP commented: "There are clearly good environmental and health reasons why we should be seeking to control the emission of VOCs. Equally, I would say there are reasons of resource efficiency that we can use to justify using legislation to drive industry forwards in more sustainable operations."

Representatives from various sectors discussed existing innovations that enable solvent based products to be used in a way that reduces VOC emissions by using an increasingly varied selection of abatement technologies. Some from the paint industry also discussed the use of efficient application methods such as electrostatic spray and low VOC technologies such as powder coatings where performance could be guaranteed.



Parliament Rapporteur Professor Cabrol MEP

Dr Ian Dobson commented: "The paint industry has taken great strides in reducing VOC emissions. But, it is not alone. Emissions from all solvent-using sectors have halved per unit of production over 20 years – representing a 100 per cent efficiency gain. The solvents industry welcomes legislation for environmental gain – as long as it makes economic sense – to build further on existing environmental achievements."

The proposed directive will now be discussed by the Council of Ministers and final adoption is expected around Spring 1999.

Solutions – your feedback

Welcome to the second issue of *Solutions*, the newsletter from the European Solvents Industry Group (ESIG).

An overwhelmingly positive response to our questionnaire about the first issue of *Solutions* shows there is a need for a regular publication providing news and useful information about solvents and the industry. We will be reporting on topics you wish to see in future issues including:

- EU and national legislation on VOC emissions
- solvents use in specific

sectors, including paints and coatings, pharmaceuticals, printing inks and adhesives

- health and safety advice
- environmental facts about solvents and new abatement techniques for VOC emissions

Mr Wolfgang Weide, Secretary General of the European Rotogravure Association (ERA) won a Waterman fountain pen in our questionnaire prize draw – thank you to all who

responded. On hearing of his prize, Mr Weide said, "the *Solutions* newsletter is a valuable source of information about solvents issues, and I look forward to receiving future editions."

ESIG has also recently published a series of fact sheets – please contact Terry Badcock at CEFIC for copies, or with any further comments or questions you have about *Solutions*.

A day in the life of a solvent

ESIG takes leading chemical journalists through the product life cycle of a solvent from production through to storage, usage and emission management.

Leading European chemical and paint journalists recently had a chance to investigate the solvents industry's commitment to Responsible Care® during a visit to the UK in May. The two day programme, organised by ESIG, featured key steps of a typical solvents' life cycle including:

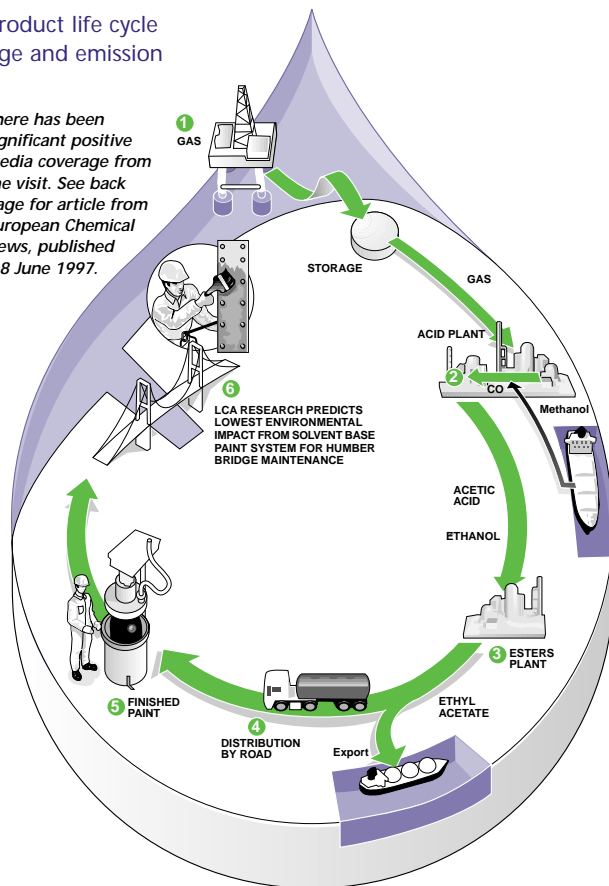
- *the manufacturing process*: starting with a tour of one of BP Chemicals' solvent producing plants in Hull, the group of journalists followed the process from North Sea gas arriving at the plant to production of acetic acid and manufacture of ethyl acetate. The tour included a visit of the acetate plant control room which shows the stringent health and safety procedures in place within the industry.
- *using solvents to make paints*: next stop was the Croda paints factory in Hull to look at how solvents are used in the manufacture of paints and how Croda manages environmental protection.
- *applying the paint*: the final port of call for the journalists was the Humber Bridge – the longest single-

span suspension bridge in the world and an excellent example of solvent based coatings in action. The external area of the bridge is exposed to the worst rigours of a harsh marine climate and really needs the durability and performance that solvent based coatings provide so effectively.

The journalists' visit coincided with the publication of a life cycle assessment undertaken by ESIG member BP Chemicals, which compared the environmental impacts of different options of painting the Humber Bridge over a 15 year period. The research provides strong evidence of the environmental benefits of solvent based coatings over water based products in maintenance applications.

The wind-swept journalists left Hull with information on the latest developments in the industry and with the resounding message from both industry and its customers that the solvents industry is committed to a long term future based on adherence to the principles of Responsible Care®.

There has been significant positive media coverage from the visit. See back page for article from European Chemical News, published 2-8 June 1997.



case study

Product stewardship in action:

Solvents provide solutions to many challenges: protecting crops; extracting food ingredients and producing pharmaceuticals.

THE SAFE handling of solvents through the whole chain of production and use is critical for best practice and results. Indeed, a manufacturer's operating licence depends increasingly on its products being handled safely. Manufacturers always ensure customers have up-to-date information and advice about solvents.

One example of product stewardship is a safety appraisal service from Shell

Chemicals, an ESIG member whose programme ensures maximum safety at customer handling and storage facilities.

An expert team trained in specialist risk appraisal techniques at Shell's Chester (UK) operation undertakes safety appraisals of customer product reception facilities and trains Shell personnel and customers across Europe to identify potential risks.

According to Pat Murray of Shell's health and safety team, "our world-wide appraisal service is dedicated to minimising risks and ensuring a full appreciation of safe handling and storage of bulk chemicals, including solvents."

A two hour appraisal with a customer includes checking electrical equipment,





Responsible Care®

New VOC emissions data

The Chemical Industries Association's (CIA) fifth annual *UK Indicators of Performance* survey, produced as part of the organisation's Responsible Care® commitment, shows VOC emissions from chemical plants fell by a further seven per cent between 1995 and 1996.

This reduction reflects the European solvents industry's ongoing commitment to reducing emissions and achieving the highest standards of environmental protection.

New absorption process reduces VOC emissions

The BIP Group Limited, a UK chemical manufacturer, has developed a new absorption technology for reducing VOC emissions from composite resin producing processes by an anticipated 95 per cent.

This new technology absorbs VOC materials into polyethylene glycol-based oil and then strips them with steam to recover the VOCs.

The technology will be applicable to VOC mixtures consisting of alkanes, alkenes, aliphatic and aromatic hydrocarbons, halogenated hydrocarbons, aldehydes, ketones, alcohols and amines.

Best practice management of workplace solvent vapours

ESIG will shortly publish new 'best practice' guidelines to help solvent users design simple and effective monitoring programmes to measure airborne solvent vapour concentrations.

Measurement of workplace exposure is useful for a number of reasons:

- to confirm safe working conditions – compliance with occupational exposure limits (OELs)
- to determine the need for, and the effectiveness of, exposure controls
- to comply with specific legal requirements

The guidelines look at what should be measured, where measurements should be taken, how often and for how long.

According to the ESIG health and safety experts, two broad types of measurements are currently used: direct and indirect.

Direct measurements provide results immediately and range from the relatively simple, for example, chemical indicator tubes, to the more complex such as electronic instruments which provide continuous reading of airborne concentrations.

Indirect techniques involve absorption of the vapour onto a collection media, such as charcoal, and subsequent analysis in the laboratory to provide

the average concentration over the sample period.

The guidelines detail factors to be considered when selecting air monitoring techniques and highlight advantages and disadvantages in a helpful reference chart.

Interpreting the results The results of measurements may form the basis of significant decisions regarding worker health, compliance with regulations and investment in control measures. It is therefore vital that the results are interpreted and used correctly. To facilitate this, a flow chart advises users how to act on the results in support of the health risk assessment process.

The guidelines come with a user-friendly list of 'do's and don'ts' summarising key messages and information.

The guidelines have been developed by ESIG health and safety experts and bring together industry best practice on the topic. The best practice guide will be available on request from February 1998. For a copy of the guidelines contact Terry Badcock at CEFIC (details overleaf).

handling solvents with care

discharge facilities, emissions and unloading procedures against set standards. Proximity to residential areas and access roads are considered along with details like earthing bonds on storage tanks and flame arrestors on vent pipes. An overall score is calculated – a low score indicates low risk.

"The survey is not an examination, but an opportunity to advise in areas where we have particular knowledge," explains Murray. "The assessor always has an extensive understanding of product handling. The check list is also available separately for customers to do their own self appraisal."

Fisher Scientific UK recently benefited from the audit programme with an

appraisal of storage facilities at their Loughborough plant where pharmaceutical intermediates, fine chemicals and high purity solvents are manufactured.

"Safety is paramount and we required confirmation that we do everything possible to minimise risk to staff and the environment. Recommendations were dealt with quickly and we are confident that our solvents are being handled as safely as possible", commented Keith Robinson, Chemical Production Manager.

Other ESIG members have similar safety service schemes in place and work with customers to provide easy-to-implement guidelines to ensure continuing safe use of solvents.

Diary dates

Pinturama

March 4 – 7, 1998 Valencia, Spain

VOC 7th Annual Conference

March 9 – 10, 1998 London, UK

Advances in Adhesives and Sealants Technology

March 11 – 12, 1998 Brussels, Belgium

New Technologies for Industrial Finishing

March 17 – 18, 1998 Birmingham, UK

Protective Coatings Europe

April 1 – 3, 1998 The Hague, The Netherlands

VdL – General Assembly (Association of German Paint Manufacturers)

May 18 – 20, 1998 Kassel, Germany

CEPE – General Assembly

June 3 – 5, 1998 Antwerpen, Belgium

XXIV. FATIPEC-Congress

June 8 – 11, 1998 Interlaken, Switzerland



Its customers face heavy investment to comply with new EU directives. Its public image is tarnished. But the solvents industry is optimistic about its future. Marjorie Walker reports.

1.5m tonne/year at a cost to industry of Ecu80bn (\$92bn).

However, once these measures are implemented any additional efforts to improve Europe's air quality will need serious study. Ian Dobson of the European Solvents VOC Co-ordination Group warns that from this point the cost of each percentage improvement in air quality rises steeply. One of the main goals of ESIG is to ensure that for this and future legislation, the cost of reducing emissions is in proportion to the environmental gain.

The costs of implementing current legislation have been onerous and already have implications for the competitiveness of European industry. ESIG is committed to working with solvent users to achieve the most cost-effective solutions to the new legislative requirements on them.

ESIG has recently been involved in a life-cycle study for maintenance painting focused on the UK's Humber Bridge. The study suggests the environmental impact of water-based paints or high solids coatings in maintenance can be much more damaging than the use of solvent-based paints. Life-cycle analysis was used to examine options for maintaining the Humber Bridge, still officially the longest single span bridge in the world. The options studied ranged from the current solvent-based system to a high solid system or a water-based system and covered a 15 year period.

The study unequivocally endorsed the continuing use of the existing solvent-based paint system. Its compatibility with the existing paint system meant that there was no requirement to strip and clean old paint from the bridge. If water-based coating or high solids coating using a non-compatible solvent had been used, the bridge would have had to be completely stripped before the new paint system could be used.

The impact on the environment from this would have added a substantial burden in terms of mineral ores and particulates and landfill requirements. Also important was the durability of the solvent-based coating as opposed to the water-based coating. The water-based coating would have to be renewed every five years to guarantee the bridge's structural integrity.

'It is the combination of enhanced performance with cost efficiency which generally results in an environmental gain,' says Hudson. 'The total life of a product should be taken into consideration when weighing up the environmental impact.'

The solvents industry has already made enormous strides in reducing solvent emissions. Over the past 15 years solvent emissions in western Europe have halved per unit of production and new technologically developed solvents which are more efficient and have a reduced impact on the environment are more widely used.

Peter Hudson, technical liaison manager, industrial chemicals division, Shell Chemicals Europe, spoke for the European Solvents Industry Group (ESIG), which represents hydrocarbon and oxygenated solvent producers, when he said recently that the solvent industry welcomes sensible cost-effective legislation. However, it does have concerns over parts of the VOC directive which duplicate other legislation and add administration and compliance costs for marginal emission reductions.

Solvents suffer from an image problem, being associated in the public's mind with ozone depletion and teenage glue-sniffers. A recent open day set out to challenge conventional notions that low solvent use is 'good for the environment' and that efforts to replace solvents with alternative non-solvent-based products reduces the overall bur-

den of pollution.

Solvents' role in ground level ozone formation was also challenged. Looking simplistically at data suggests that solvent use accounts for 24% of western European VOC contribution to ground level ozone. However, in reality solvent use accounts for only 10% of European Union VOC emissions if weighted for reactivity and seasonal influences. Vegetation is a much larger problem accounting for 57% of EU VOC emissions under this analysis.

For some time it has been recognised that there is often a price to pay for lower solvent use. The performance of water-based paints may be adequate for some applications but in other, more demanding uses it is wholly inadequate. But it is not just a performance issue. Lower solvent use often equates to higher energy use, increasing pollution from other sources. Water-based inks which require a heat source to dry can offset some of the benefits of reductions in VOC emissions through increased nitrous oxide emissions from power stations.

Already legislation is in place or close to implementation which will reduce volatile organic solvent and nitrous oxide emissions. This will lead to European ozone levels meeting

exacting standards by 2010, in all but a small area of northern Europe and a few southern European cities, most notably Athens.

The most significant for the solvents industry is the adoption by the European Commission of proposals to regulate emissions from 400 000 solvent users across more than 30 manufacturing sectors. The measures will affect paints, inks and coating manufacturers, adhesives producers, the rubber industry, dry cleaning and the pharmaceutical industry. Current estimates suggest the measures will reduce emissions by

