

APPLICATION PROCESS FOR 7th ESIG AWARD NOW OPEN! [see page 4 for more information](#)

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THE BENEFITS OF PENTANE IN THE PRODUCTION OF INSULATION FOAMS

Every day, we benefit from the diverse range of available solvents and their unique properties. From paints, coatings and personal care products to cleaners and inks, solvents play an essential role, helping to provide solutions in many aspects of modern business and home life.

Pentane as a blowing agent

Pentane is a hydrocarbon solvent that belongs to the family of paraffins. It plays a fundamental role in the production of polystyrene (PS) and polyurethane (PU) insulation foams, serving as a blowing agent that turns the raw plastic material into foam. A small quantity of pentane indirectly provides important performance characteristics to these foams: primarily, great thermal insulation properties.



Pentane: adds great thermal insulation properties



Pentane: keeping food fresh

Energy-saving potential

The benefits of pentane are therefore of particular interest from the perspective of energy saving. Pentane yields great thermal insulation properties to PS and PU foams, which ultimately leads to lower energy consumption and the improvement of energy efficiency, in line with the targets and priorities set by the EU in the energy field.

Used to insulate almost anything, from walls and roofs to freezers and refrigerators, PS and PU foams are vital for saving energy in the construction sector and in domestic appliances. The building sector alone accounts for 40% of the EU's energy requirements and offers the largest single potential for improving energy efficiency. Meanwhile, the electricity used for domestic appliances in households accounts for 25% of the final energy needs in the EU.

Furthermore, the small proportion of pentane that is used in the production of PS and PU foams easily decomposes in the atmosphere, avoiding any adverse impact on the ozone layer.

By respecting the environment, insulating homes and keeping food fresh, the use of pentane in the manufacture of insulation foams is just another example of the many applications of solvents and the benefits they bring to our daily lives.

PARTICLES REVISITED

The main air quality problems in Europe are ozone and particles (PM). Ozone has already been tackled by reduction of both VOCs and NO_x, and the main challenge is intercontinental pollution mainly from Asia which continues to increase background Ozone levels.

PM is now the dominant pollutant and secondary particles are more difficult to quantify because they are formed by chemical reaction in the atmosphere and can be transported from other countries.

Of the two pollutants, PM is considered more damaging to human health because particles can penetrate the inner lung passages.

Urban Air Particles in Europe

A first estimate¹ of PM_{2.5}, particles of 2.5 microns or less, shows two equal concentrations in summer months in European urban regions. Primary particles are essentially from diesel engines, and secondary particles are formed by photochemical reactions, both contributing in equal proportions to atmospheric PM_{2.5}.



Blue sky thinking: in total, less than 1% of secondary PM originates from VOCs from solvents

Secondary Particles

Secondary particles fall into two main categories:

Inorganic aerosols such as ammonium sulphates and nitrates and organic aerosols formed by the photochemical oxidation of VOCs and terpenes from natural biogenic sources.

Ammonium sulphates contribute to some 30% of secondary particles, but it is steadily decreasing thanks to the controls on Sulphur Dioxide emissions. Ammonium Nitrates account for 50% of all secondary PM_{2.5}, and the current strategy of reducing NO_x to further reduce Ozone levels will help towards lower levels of these Nitrate particles.

Organic aerosols account for 15% of secondary particles in the air. The distribution of secondary PM in Europe is shown in the figure on the right.

Secondary Inorganic Aerosols

Given the decline in ammonium sulphates, attention is now being concentrated on the important ammonium nitrates in European air. The main source of NO_x is from vehicle exhaust, which represents 50% of all NO_x in the atmosphere. New engine emission controls on diesel engines reduce both NO_x and PM_{2.5}, and consequently ammonium nitrates will also decline.

Secondary Organic Aerosols (SOAs)

Most recent modeling work by Jenkin et al² has been used to provide first estimates of Secondary Organic Aerosol Potentials, (SOAPs). This new work shows that ALKANES have relatively small SOAPs. Although terpenes have small values, they dominate the SOAs in the atmosphere, thus remaining a high proportion of the total. This leads to the conclusion that biogenic emissions are responsible for 80% of all secondary organic aerosols.

Toluene and Xylenes are now deemed to be important in the formation of SOAs, and are found in both solvents and gasoline engine exhaust. This work will lead scientists into the new debate of secondary organic aerosol potentials as was done with POCPs (Photochemical Ozone Creation Potentials) for Ozone in the late 1990s.

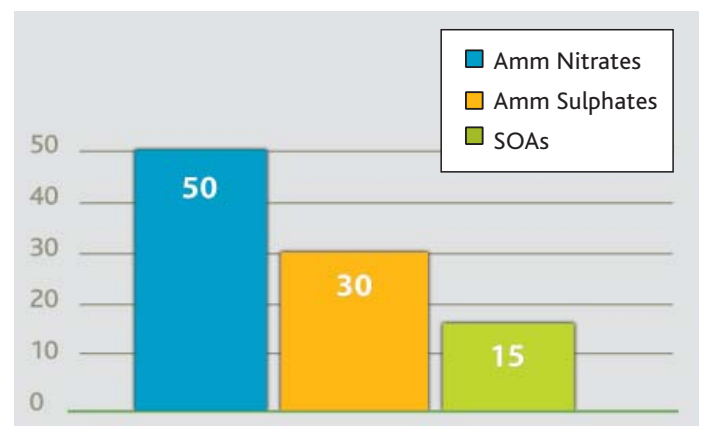
The Way Forward

The potential for reducing primary particles from diesel engine exhaust is good and attention is now on reducing secondary particles. Ammonium Nitrates which represent 50% of all secondary particles in European air in summer will be further reduced by new diesel engine technology. This will help to improve human health.

Secondary organic aerosols are a small contributor to secondary PM, and are mainly formed from natural sources such as terpenes. However, toluene and xylene have been identified as a prime source of man-made SOAs and are likely to attract attention in the future.

Evidence is growing that SOAs are good for the environment in that they reduce Global Warming³! As in all air quality matters, a balance must be found between health effects of reducing secondary organic aerosols and any reduced global warming.

The percentage components of secondary particles



It should be noted that 85% of all secondary organic aerosols are formed from natural hydrocarbons, such as terpenes, and only 15% from man-made sources.

In total, less than 1% of secondary PM originates from VOCs from solvents.

¹ Pearson, J.K., "Improving Air Quality" SAE 2001, ISBN 0-7680-0236-2

² Jenkin, M., Derwent, R.G., Pilling, M.J., "Simulating regional scale secondary organic aerosol formation during the TORCH 2003 campaign in the southern UK", Atmos, Chemistry and Physics, 6, 403 - 418, 2006

³ Solutions - ESIG Newsletter, The Link between Air Quality and Global Warming, December 2007

'THE SOLVENTS FAMILY' BROCHURE NOW AVAILABLE IN FIVE LANGUAGES

"The Solvents Family" brochure aims to familiarize interested readers with the wide variety of uses of solvents, illustrating how they are essential for many products in our everyday life. Simple and easy to understand, the brochure includes a family tree of Hydrocarbon and Oxygenated Solvents, showing the relationships between the different types of existing solvents and details of their use.

Now available in English, French, German, Italian and Spanish, "The Solvents Family" brochure can be downloaded from the ESIG website www.esig.org. If you wish to receive hard copies free of charge, please send an email to the ESIG Secretariat at sph@cefic.be or call +32 (0)2 676 72 96.



SAFE USE OF SOLVENTS: THE 'DO'S AND DON'TS' POSTER

Developed by ESIG as part of the Solvents@Work campaign and aimed at solvent users, the "Do's and Don'ts" poster encourages the safe handling of solvents, providing easily understandable recommendations on how to use solvents safely in the workplace.



The poster is available in 16 EU languages and can be downloaded from the ESIG website www.esig.org.

If you wish to receive hard copies free of charge, please send an email to the ESIG Secretariat at sph@cefic.be or call +32 (0)2 676 72 96.

A NEW TOOL TO FACILITATE HYDROCARBON SOLVENTS REGISTRATION UNDER REACH

Following its official launch on 1 June, the European Chemicals Agency (ECHA) has started to accept pre-registrations of chemicals under the REACH (Registration, Evaluation and Authorization of Chemicals) legislation. The agency has a challenging task ahead, given that some 200,000 pre-registrations are expected. Companies that make or import more than one tonne of chemicals per year will be encouraged to pre-register these chemicals online via the REACH-IT portal before 1 December 2008.

Following the pre-registration phase, companies will have until 1 December 2010 to complete the final registration and market authorization of all substances produced or imported in quantities equal to or greater than 1,000 tonnes a year.

In order to facilitate an appropriate registration of hydrocarbon solvents, the Hydrocarbon Solvents Producers Association (HSPA) has conducted an in-depth assessment to characterize its substances better and to adopt a consistent substance identification system.

This new system is easy to use and is completely compatible with the relevant REACH and OECD guidance documents. It also ensures all key components required for a clear naming of the substance with the inclusion of:

1. the substance nature as 'Hydrocarbons';
2. the carbon range;
3. the component split, including:
 - Percentage of aromatics as specified in the HPV program
 - Components that determine the classification and labeling

An example of the new naming convention for a classical White Spirit dearomatized would be: 'Hydrocarbons, C11-C14, n-alkanes, isoalkanes, cyclics, <2% aromatics'

Lastly, users will notice its significant benefits from a registration perspective as it:

- facilitates identification of the substances and SIEF formations;
- provides more clarity for authorities, for registrants (other than HSPA members) and for the market;
- allows more targeted hazard characterization and risk assessments; and
- avoids misperceptions and misclassifications.

If you are interested in knowing more about this nomenclature, please visit the ESIG website www.esig.org.

GUIDANCE ON THE INTERPRETATION OF THE SOLVENTS EMISSIONS DIRECTIVE

ESIG has developed a new guide in order to provide further help to solvent users in understanding the implications of the current European Solvents Emissions Directive (SED) before its forthcoming review. This new guide, published jointly by ESIG and ESVOC (European solvent producers and downstream user associations), combines the full text of the Solvents Emissions Directive along with clarifications and answers to frequently-asked questions. It also includes an extensive clarification on the Solvent Management Plan and guidance on how to deal with inaccuracies.

This new document, available at the ESIG website www.esig.org, is intended to be a reference point for solvent producers and users when understanding and dealing with the SED.

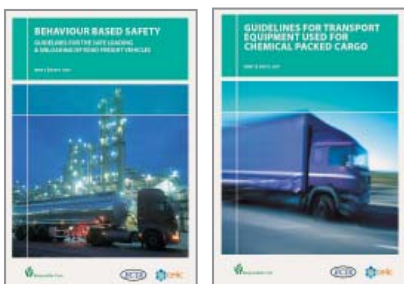
Please note: the guidance applies to the current Solvents Emissions Directive. This directive and a few other environmental directives are under review, but it will take years before any new legislation enters into effect.

REACH GENERIC EXPOSURE SCENARIOS

Generic exposure scenarios (GES) are a key part of REACH compliance for solvent suppliers and the basis on which information on exposure controls can be consistently communicated to solvent users. These exposure scenarios outline a set of control conditions that describe how a substance can be safely used throughout its life-cycle.

This control covers potential risks to both human health and the environment. ESIG is currently developing a GES library that will identify how solvent users will be affected by REACH and which generic exposure scenarios will be relevant for those users. This new library will be available in the coming months. More detailed information will be provided in the next issue of Solutions.

GUIDELINES ON THE SAFE HANDLING OF SOLVENTS DURING TRANSPORTATION



Behaviour Based Safety (BBS) is a program that aims to increase the safety of operations by positively influencing the behavior of all people involved through a process of observation, coaching and communication. The objective of the brochure "Guidelines for the safe loading & unloading of road freight vehicles" is to provide assistance in the prevention or elimination of unsafe conditions and situations during loading/unloading operations, including sampling, especially when working with potentially dangerous substances.

A second brochure, "Guidelines for Transport Equipment used for Chemical Packed Cargo", is also part of the BBS program. These guidelines have been developed by CEFIC and ECTA (European Chemical Transportation Association) in order to offer guidance regarding transport equipment used for the transport of packed cargo. It promotes the use of appropriate equipment for the transport of packed chemical cargo and the application of the best practice for securing and storing it.

Both guidance documents can be downloaded through the 'Links - Useful documents' section of the ESIG website www.esig.org.

ESIG PRODUCT STEWARDSHIP AWARD

Drogas Vigo hailed for its achievements in the use of solvents

The winner of the ESIG Product Stewardship Award 2007 was Drogas Vigo, a family-owned chemical company of 20 employees based in Spain and Portugal. The award ceremony took place last October in Paris as part of CEFIC's Responsible Care Forum. In addition, a special event was held in Spain on 27 June 2008.

The event took place at the University of Vigo and was widely covered by the local media. It was attended by key representatives from the solvents industry, customers, solvent users and public authorities, such as Richard Gowland, Technical Director of the European Process Safety Centre; Emilio Manuel Fernández Suárez, Director General for Sustainable Development from the Xunta de Galicia; Dorothee Arns, Secretary General of ESIG and José Antonio Ruiz, Chairman of ESIG.

"It was a very successful event that demonstrated how good practices in health, safety and environment are also good business," said Mr. Ruiz.

Established in 1999, the ESIG Product Stewardship Award is designed to showcase and reward excellence and continuous improvement in the use of solvents. The award is part of the industry's commitment to responsible and ethical management of health, safety and environmental aspects of solvents throughout their life-cycle.

Application process for the 7th Edition now open!



The ESIG award

The next ESIG Product Stewardship Award will be held in 2009 and the application process is now open. Applicants from all European countries and any industry sector related to the production, supply and handling of solvents are highly welcome.

An independent jury consisting of senior representatives from the European Commission, the European Parliament, media and trade associations will be looking for innovative projects or

programs that have achieved clear improvements for workers and society as a whole.

The winner will be invited to a European award ceremony in the autumn of 2009 and will receive a high level of promotion on a European as well as on a local level.

Further details on how to apply, including an application form and a model to follow when completing the form, are available at the ESIG website www.esig.org.

More information in the next issue of Solutions.

SOLUTIONS IS PRODUCED BY THE EUROPEAN SOLVENTS INDUSTRY GROUP.

For further information please visit our website at www.esig.org or contact:

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