



What are solvents?



- A substance, usually liquid, that has the ability to dissolve another substance (the solute) to form a solution.
- Water is the most basic ubiquitous solvent that, for example, dissolves salts in the sea or sugar in tea or coffee.
- Since many materials cannot be dissolved in water, organic (non-aqueous) solvents were developed.
- Many organic solvents contain carbon, hydrogen and oxygen atoms –the basic building blocks of life.

Which solvents are in ESIG's portfolio?

ESIG, the European Solvents Industry Group, represents the producers of the following two main groups of **organic solvents**:

- hydrocarbon solvents containing carbon and hydrogen atoms only
- oxygenated solvents containing carbon, hydrogen and oxygen atoms

Oxygenated solvents can be divided into 4 main groups used commercially:

- Alcohols that can be mixed with water and diluted (examples: isobutanol, N-butanol, ethanol)
- Ketones that can be volatile (examples: MEK, MIBK, acetone)
- Esters also known as acetates
- Glycol ethers, which is a versatile group of products. Large group of ca 30 substances classed as E- or P-series depending upon whether they have been manufactured based on ethylene or propylene

All have a high solvency power and a characteristic odour. Oxygenated solvents are used widely in water-based applications such as detergents and water-based paints.

Oxygenated solvents are usually simple, single molecules. Some glycol ethers (notably the P series) can be present in isomeric forms.

Hydrocarbon solvents are mostly very traditional solvents, which have been used in manufacturing processes for many years. They include two main groups:

- Aliphatics – with low water miscibility & low surface tension
 - paraffins (pentane, hexane)
 - de-aromatised (D-grades)
 - cyclics like cyclohexane
- Aromatics with a high solvency power, heavy odour, higher toxicity (compared to aliphatics)

Developments in de-aromatised hydrocarbons have become more prevalent in recent years as hazard considerations in formulations have become an issue for end-users and regulators.

Hydrocarbon distillation cuts are known as UVCB substances – Unknown and/or Variable composition, Complex reaction products and/or Biological materials. They are usually characterized by their phys-chem properties (boiling point, density) and manufacturing method (including distillation range) and/or feedstock rather than their chemical composition which can be very complex molecular weight and isomeric composition.

For a full list of substances, please
have a look at our website:

Oxygenated Solvents / Hydrocarbon Solvents

Which solvents are excluded from ESIG's portfolio?

ESIG only represents the **hydrocarbon or oxygenated substances, which are mainly used as a solvent**. However, we can advise on how to handle safely and sustainably any substance that can be used as a solvent.

Excluded from ESIG's portfolio are halogenated solvents

Although also organic solvents, this category consist of chlorinated hydrocarbon solvents. The manufacturers have their own dedicated trade associations: the [European Chlorinated Solvents Association](#).

Excluded from ESIG's portfolio is also any substance which main use is not as solvent

- **Toluene, Benzene and Xylene** - Lower olefins sector group
- **DMF, NMP, THF**: these substances used as solvents have a hydrogen atom bound to a nitrogen - BDO & derivatives Sector Group
- **Propylene Glycols** - PO/PG sector group
- **Methanol** - Methanol sector group
- **Ethanol** - outside Cefic; for renewable ethanol see e-pure, or also the industrial ethanol association

Some facts

The European solvents industry



7_k

direct employees in Europe



4_B

turnover / year



5_M

tonnes of solvents sales / year



28_M

of R&D spending / year

Solvents are used in different technical functions in almost all manufacturing processes to produce chemical substances or articles. The solvents industry directly employs 7,000 people in Europe & indirectly supports 10,000,000 jobs.

Solvents manufacturers produce 5 million tons of solvents each year in the EU contributing €4 billion (combined turnover) to Europe's economy. In addition, over half a million companies use solvents in Europe. Solvents are an essential part of everyday life.

For which applications are the 5 million tons of solvents sold per year used in the EU?

Solvents are used everywhere!

- **No paints without solvents:** once the paint has been applied the solvent evaporates, allowing the resins & pigment to produce a film of paint that dries rapidly.
- **No medicine without solvents:** solvents provide molecules to build drugs and are also used as a medium for extraction and purification.
- **No computers without solvents:** the microelectronics industry uses electronic-grade solvents (with a low level of metal ions) to produce microcircuits and to clean sensitive components.
- **No printing without solvents:** whatever the support, magazines, food packaging or labels, solvents help printing inks to be applied, stay put, bold and bright. Solvents are used to control the thickness (viscosity) and allow ink to flow without damaging the equipment of the machines. They also assure optimal drying in high speed printing.
- **No perfumes without solvents:** fragrance oils from fruits, roots, flower or bark are extracted and purified using solvents. Spraying perfume at the right place and for the right duration only happens thanks to solvents.

Solvents' application in EU - 2017



* Other chemical use including rubber/polymerisation - oil & seed/food t extraction - agrochemicals



MORE INFORMATION ON SOLVENTS' APPLICATIONS AT:

www.esig.org/discover-solvents
Factsheet: What are solvents?
Solvents family brochure

How are solvents regulated?

Solvents are directly or indirectly regulated by several EU regulations and directives:

VOC RELATED /AIR QUALITY

National Emission Ceilings (NEC) Directive
(2016/2284/EU)

Industrial Emissions Directive (IED) 2010/75/EU

Ambient Air Quality Directive 2008/50/EC

"Paints Directive" 2004/42/EC

Ozone Directive 2002/3/EC

National Emission Ceilings (NEC) Directive
2001/81/EC

Solvent Emissions Directive (SED) 1999/13/EC

Integrated Pollution Prevention and Control
(IPPC) Directive 96/61/EC

OTHER EHS REGULATIONS

Regulation on Personal Protective Equipment
(PPE) (EU 2016/425)

CLP Directive (EC 1275/2008)

REACH (EC 1907/2006)

Carcinogens and Mutagens Directive (CMD)
2004/37/EC

Chemicals Agent Directive (CAD) 98/24/EC

OSH Framework Directive (89/391/EC)
Regulation on Personal Protective Equipment
(PPE) (89/686/EC)

Dangerous Substances Directive (67/548/EEC)

2017

2011

2009

2007

2005

2003

2002

2000

1999

1997

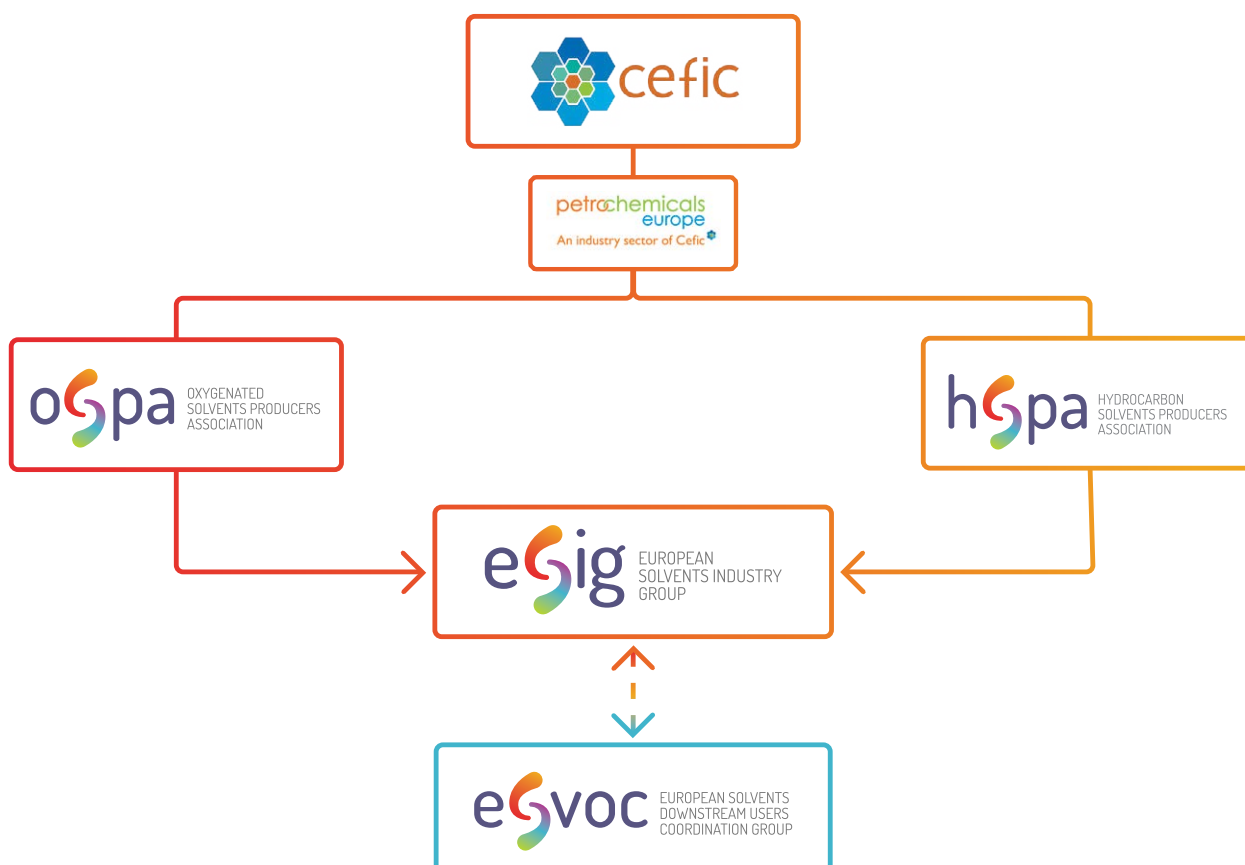
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What does ESIG do?

ESIG is a joint activity of the Oxygenated Solvent Producers Association (OSPA) and the Hydrocarbon Solvent Producers Association (HSPA). Whereas ESIG covers environmental or

product stewardship issues relevant for all its members, OSPA and HSPA focus on substance specific topics.



ESIG's overall mission is to promote the safe and sustainable use of oxygenated and hydrocarbon solvents in Europe and to ensure that the regulatory framework relevant to the manufacture, storage, distribution and use of these solvents is based on sound science and best practice. ESIG provides advice and guidance to its members and downstream users to comply with the latest legislation and shares insights and advice with all parties that use or handle solvent products.

To do so ESIG has set up ESVOC, the European Solvents Downstream User Coordination Group (originally European Solvents Volatile Organic Compounds Coordination Group), a unique platform that brings together manufacturers and their downstream users trade associations. It consists of representatives of 30 different associations.

EUROPEAN SOLVENTS INDUSTRY GROUP

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A sector group of Cefic

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petrochemicals
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