

## FACTS ABOUT TRICHLOROETHYLENE

## TRICHLOROETHYLENE In Europe

Trichloroethylene is widely recognized as one of the most efficient solvents with unique properties for high precision surface cleaning and degreasing.

Taking advantages of the favorable properties of this solvent are often in contrast with the complex regulatory situation which may cause unnecessary doubts on the future use of trichloroethylene in industrial metal cleaning applications.

### REGULATORY SITUATION

Trichloroethylene has been reclassified as a category 2 carcinogen under the EU Dangerous Substances Directive. This reclassification affects different national and international legislations. Among the most important are:

- EU Marketing & Use Directive (76/769/EC)<sup>1</sup>, Restrictions on marketing and sales to endusers
- EU Solvents Emission Directive (SED), also known as VOC Directive (1999/13/EC)<sup>2</sup>
- EU Carcinogen Directive (90/394/EEC)<sup>3</sup>
- REACH<sup>4</sup>

The requirements to fulfill the regulatory requirements are based on the clear intention to minimize emissions to environment and to prevent exposure to human. There is no ban of trichloroethylene for industrial applications.

<sup>1</sup> Council Directive 76/769/EEC of 27 July 1976 on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31976L0769:EN:HTML>

<sup>2</sup> COUNCIL DIRECTIVE 1999/13/EC of 11 March 1999 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installations. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1999:085:0001:0022:DE:PDF>

<sup>3</sup> Council Directive 90/394/EEC of 28 June 1990 on the protection of workers from the risks related to exposure to carcinogens at work (Sixth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC) <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31990L0394:EN:HTML>

<sup>4</sup> European Chemicals Agency, REACH (Registration, Evaluations and Authorization of Chemicals) [http://echa.europa.eu/reach\\_en.asp](http://echa.europa.eu/reach_en.asp)

The following regulatory measures need to be respected to fulfill the requirements:

1. *Prevention of use or substitution if possible*
2. *Control of emissions by specific technical measures*

#### 1. Prevention of use if possible

To fulfill the regulatory measures above, users of trichloroethylene are obliged to search for an alternative cleaning medium. Experiences have shown that in many cases the required cleaning performance can be matched by a cleaning process based on perchloroethylene or modified alcohols. But there is still a variety of cases where the replacement of trichloroethylene is very difficult or rather economically not feasible as mentioned above.

#### 2. Control of emissions by specific technical measures

A variety of legislations, processes and commitments are in place to avoid emission of trichloroethylene throughout the whole life time of the product. The regulated limits are:

- Maximum concentration in vent exhausts max. < 2 mg/m<sup>3</sup> (VOC-Directive) and max. 10 g/h in the mass flow
- Workplace concentration OHL (TWA) 10 – 100 ppm depending on country

The producers' measures to achieve these limits include– according to the Cradle to Cradle principles – in detail:

- Handling of the solvent in a closed product cycle in designated safety containers (SAFE-TAINER™ system)
- Sales of trichloroethylene only for use in enclosed cleaning machines (Trichloroethylene Voluntary Industry Commitment<sup>5</sup>; Enclosed cleaning machines, European Standard EN 12921-4)

<sup>5</sup> ECSA (European Chlorinated Solvent Association) charter for the safe use of Trichloroethylene in metal cleaning developed in consultation with the European Commission and European Member States <http://www.eurochlor.org/upload/documents/document282.pdf>

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Based on the processes and technology available for industrial cleaning, use of trichloroethylene in open processes is not acceptable. Furthermore, open use of trichloroethylene will be subject to further regulation under REACH.

### USE OF TRICHLOROETHYLENE

There are a variety of cases where the replacement of trichloroethylene is very difficult. Examples may include:

- Industrial norms and approvals which are based on trichloroethylene (e.g in the aerospace & aeronautic industry, asphalt testing etc.)
- Specific contaminations such as epoxy- or silicon resins which show a unique solubility in trichloroethylene
- Specific cleaning processes with limited process window in respect to cleaning results, oil and material compatibility, distillation and recovery properties etc. (any process changes may narrow process limits resulting in unsafe, unstable and non economical cleaning process.)

Under such circumstances, the continued use of trichloroethylene is permitted under defined regulatory conditions which will minimize emissions of the solvent by technical and organizational measures.

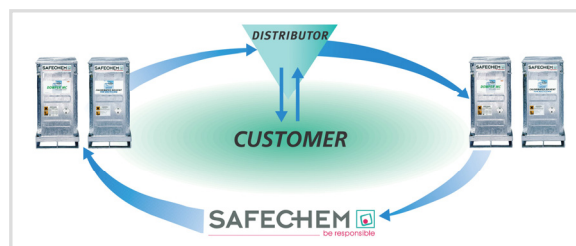
### STEPS FOR LEGITIMATING THE USE OF TRICHLOROETHYLENE

1. Define reasons why trichloroethylene is currently used
2. Check if trichloroethylene can be substituted by an alternative "drop in" cleaning solvent such as e.g. perchloroethylene
  - a. Cleaning performance requirements
  - b. Process requirements
  - c. Solvent stability requirements

3. Invest in new cleaning equipment and evaluate best process and solvent options with regards to:
  - a. Current and future cleaning requirements
  - b. Versatility of materials / contaminations / etc
4. Seek professional information

### CONCLUSION

In applications where trichloroethylene is essential to meet quality and safety standards, trichloroethylene can continue to be used provided strict control measures are in place that guarantee compliance with the applicable regulations. It is strongly recommended that trichloroethylene is used in hermetically sealed equipment and a closed-loop safety system for handling the solvent, including delivery, transfer and take-back. It is recognized that consultancy from solvent experts, continuous solvent monitoring and stabilization extend the life time of the solvent and contribute to the proper risk management of trichloroethylene. More information are available via [www.chemaware.org](http://www.chemaware.org).



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