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Draft background document for trichloroethylene

Document developed in the context of ECHA's third Recommendation for the inclusion of substances in Annex XIV

Information comprising confidential comments submitted during public consultation, or relating to content of Registration dossiers which is of such nature that it may potentially harm the commercial interest of companies if it was disclosed, is provided in a confidential annex to this document.

1. Identity of the substance

Chemical name:	Trichloroethylene
EC Number:	201-167-4
CAS Number:	79-01-6
IUPAC Name:	1,1,2-trichloroethene

2. Background information

2.1. Intrinsic properties

Trichloroethylene was identified as a Substance of Very High Concern (SVHC) pursuant to Article 57(a) as it is classified according to Annex VI, part 3, Table 3.1 (the list of harmonised classification and labelling of hazardous substances) of Regulation (EC) No 1272/2008 as carcinogen 1B, H350 (May cause cancer), and was therefore included in the candidate list for authorisation on 18 June 2010, following ECHA's decision ED/30/2010.

2.2. Imports, exports, manufacture and uses

2.2.1. Volume(s), imports/exports

According to registration information about 50000 – 100000 t/y of trichloroethylene are manufactured or imported. No information on exports is available.

The larger part of the manufactured/imported volume is used as intermediate in the manufacturing of other substances such as fluorinated compounds. The volume allocated to uses within the scope of authorisation is above 10000 t/y.

2.2.2. Manufacture and uses

2.2.2.1. Manufacture and releases from manufacture

Trichloroethylene is produced by the catalytic hydrogenation of tetrachloroethene (BUA, 1994). A specially activated copper-palladium catalyst on a carrier material is used in the gas phase at temperatures up to 250°C (EU RAR).

Manufacture of trichloroethylene takes place in closed systems, and only occasional controlled releases are assumed to take place (ECHA 2011).

It is estimated that 400-700 workers (including maintenance personnel and contractors) are exposed during manufacture and packing of trichloroethylene (Annex XV 2010).

2.2.2.2. Uses and releases from uses

According to disseminated registration information (ECHA 2011), the substance is still used in industrial settings in the following applications where opportunity of exposure arises:

- Formulation:
- Surface cleaning (closed and enclosed systems),
- Heat transfer fluid (mainly in closed systems),
- Process chemical (e.g. in purification)
- Textile scouring
- Adhesives.

According to Annex XV (2010), the major non intermediate use of trichloroethylene is for hot vapour degreasing of metal parts (surface cleaning). It is used for the removal of substances such as oils, greases, waxes and buffering compounds, or soils. The substance has high solvent power while not having low flammability. Closed systems, including closed supply and take-back systems in safety containers are today standard in some countries like Germany and Austria. Also in the rest of Europe surface cleaning applications have converted to closed systems, either due to the European Solvent Emission Directive (for applications > 1 t/y) or due to the Industry Self Commitment (applications < 1 t/y, Annex XV 2010).

Trichloroethylene is used as heat transfer medium in the closed secondary heat transfer in industrial climate controlled installations such as wind tunnels in the automotive and aeronautic industry (Annex XV 2010). It is supposed that from such closed systems, releases occur only occasionally.

As a process solvent, the substance is mainly used in the purification and crystallisation of pharmaceuticals. These are reported to be fully-closed processes with recovery of trichloroethylene as solvent for re-use (Annex XV 2010).

In textile scouring, the use of chlorinated solvents such as trichloroethylene is reported to be the best available techniques, with significant advantages towards the water based scouring techniques (Annex XV 2010).

Trichloroethylene use in adhesives, is only remaining in specific applications (repair of conveyor belts in mines or rubber coating), where closed systems are not suitable (Annex XV 2010).

According to disseminated registration information, trichloroethylene is still used in the following professional uses where exposure might occur:

- Process chemical (e.g. in purification).
- Adhesives

Trichloroethylene is also a component of a wide range of products for professional use, such as adhesives, coatings, ink, dyes (e.g. for leather, paper, textiles) and cleaning products (ECHA 2011). The ERCs given for the professional uses indicate that all the uses are wide dispersive and both, in- and outdoor uses occur (ECHA 2011). In the case of trichloroethylene, the dermal and inhalation exposure routes are relevant (RAR 2004, ECHA 2011).

At least some activities carried out in the context of the described uses could result in exposure of workers to the substance and professionals. For instance, operations such as material transfers, maintenance, cleaning and sampling could lead to significant exposure. Particularly, certain processes reported for professionals, such as roller application, brushing, non industrial spraying or dipping and pouring (ECHA 2011) can be expected to lead to exposure. Operators in industrial settings would be expected to wear proper protection, while this can not always be expected for professionals (RAR 2004). In particular, uses of the substance in adhesives by professionals could result in widespread use and uncontrolled exposure (≈ wide-dispersive use).

Even though trichloroethylene has low bioaccumulation potential, it is suggested that the substance is not ready biodegradable in the environment (disseminated registration information), which might lead to exposure via environment. However, the RAR (2004) concluded that there is no risk from secondary poisoning, and total volumes have declined since then.

2.2.2.3. Geographical distribution and conclusions in terms of (organisation and communication in) supply chains

The use of trichloroethylene is deemed to take place throughout Europe. In particularly, the industrial use for metal degreasing and the professionals may constitute a high number of point sources.

2.3. Availability of information on alternatives[1]

Alternatives for trichloroethylene in its main use as cleaning agent or degreaser

As possible alternative substances to trichloroethylene, alkaline mixtures, halogenated (e.g. perchloroethylene, methylene chloride) and non halogenated solvents (oxygen solvents, aliphatic and cycloaliphatic hydrocarbons, as well as n-methyl 2-pyrrolidone are reported (Annex XV 2010).

For metal degreasing alternative methods, like organic/biological degreasing (using non-pathogenic microorganisms for the dirt removal), supercritical carbon dioxide or plasma cleaning (with an electrically charged gas), high pressure water and others are described (Annex XV 2010, EC 2004).

Alternatives for trichloroethylene in other uses

It is difficult to profile the availability of alternatives for trichloroethylene in adhesives, but it is likely that for most applications alternatives are available, also where low flammability is required (EC 2004). In most of these cases substitution has already taken place and for the only remaining uses (repair of conveyer belts in mines and rubber coating) alternatives might be more difficult to find (Annex XV 2010 and EC 2004).

No further information on alternatives could be found for the other uses of trichloroethylene.

2.4. Existing specific Community legislation relevant for possible exemption

No data available.

2.5. Any other relevant information (e.g. for priority setting)

No data available.

3. Conclusions and justification

3.1. Prioritisation

Verbal-argumentative approach

The volumes of trichlororethylene allocated to uses in the scope of authorisation are very high and at least some of the described uses appear to result in significant exposure of industrial workers and professionals and can be considered wide dispersive.
Therefore, based on the criteria, trichloroethylene has very high priority.

[1] Please note that this information was not used for the prioritisation.

Scoring approach

Score			Total Score (= IP + V + WDU)
Inherent properties (IP)	Volume (V)	Uses - wide dispersiveness (WDU)	
Score: 1 (carcinogen 1B)	9 (Very high volume used for applications in the scope of authorisation)	Overall score: 3 * 3 = 9 Site-#: 3 (Used at a high number of sites) Release: 3 (At least in some applications significant exposure of workers/professionals and wide dispersive use)	19

Conclusion, taking regulatory effectiveness considerations into account

On the basis of the prioritisation criteria, trichloroethylene gets very high priority for inclusion in Annex XIV.

Therefore, it is proposed to prioritise trichloroethylene for inclusion in Annex XIV.

4. References

Annex XV (2010): Annex XV dossier for identification of a substance as SVHC. Submitted by France, February 2010.

EC (2004): European Union Risk Assessment Report: trichloroethylene. 1st Priority List, Volume 31. European Commission, Joint Research Centre.

ECHA (2011): Substance information, disseminated on ECHA's webpage for trichloroethylene. http://apps.echa.europa.eu/registered/data/DISS-9c8133b7-2fc3-3484-e044-00144f67d249/index.html and http://apps.echa.europa.eu/registered/data/DISS-9c83a2d3-4a9f-1ff5-e044-00144f67d249/index.html.[2]

RCOM (2010): "Responses to comments" documents. Document compiled by the French MSCA from the commenting period 08.03.-22.04. 2010.

[2] Note that the information available here does not yet contain the information of all registration dossiers to be disseminated for this substance. ECHA anticipates to publish the remaining information by the end of 2011.