Toxics Use Reduction Program Advisory

trans-1,2-Dichloroethylene, CAS 156-60-5
(synonyms: trans DCE, trans-1,2-dichloroethene, 1,2-DCE)

The Toxics Use Reduction Program cautions companies that certain alternatives to trichloroethylene (TCE), perchloroethylene (perc) and n-propyl bromide (nPB) also present significant hazards to human health and/or the environment. *Trans*-1,2-dichloroethylene is one such alternative. It is listed on the TURA list of toxic or hazardous substances (see Table 1 below). It is, therefore, reportable if more than 10,000 lbs. are 'otherwise used' in one calendar year. ***Trans*-DCE is not considered a preferable alternative** to TCE, perc, nPB or other hazardous solvents.

Trans-DCE has a high vapor pressure (336 mm Hg @ 25°C), has a low boiling point (48.5°C), is a flammable liquid (flash point 2°C), and is a regulated VOC. While having lower human toxicity than some other halogenated solvents, *trans*-DCE is an immune system toxicant and a neurotoxin. Acute exposure can cause central nervous system depression and chronic exposure can cause liver, circulatory, immune system and central nervous system damage.

Trans-DCE is often used in blends with fluoroalkanes or hydrofluoroethers (HFEs) (e.g., Fluosolv™ CX, Vertrel™ SDG, and Opteon™ Sion). This expands the range of cleaning power of HFEs, while the HFEs lower the flammability of the mixture. While the HFEs have lower human toxicity than *trans*-DCE and are not flammable, they do contribute to global warming, break down into very persistent and toxic PFAS (per- and poly-fluoroalkyl substances) chemicals, and are more expensive than many solvents.

Identifying safer drop-in substitutes for TCE, perc, nPB and other halogenated solvents is challenging. Staff at the Toxics Use Reduction Institute (TURI) and the Massachusetts Office of Technical Assistance and Technology (OTA) would be happy to work with your company to investigate safer alternatives for your specific needs.

Reporting trans- and cis-1,2 dichlorethylene

Both *trans*- and *cis*-1,2-dichloroethylene are reportable under TURA. The *trans* isomer is reportable as an individual chemical, while the *cis* isomer is reportable as part of a category. The mixture of the two isomers is also reportable as an individual chemical under TURA. Table 1 summarizes this information for companies that may be subject to reporting requirements

Table 1. TURA Reporting for 1,2 Dichloroethylene

trans-1,2-Dichloroethylene	CAS 156-60-5	TURA listed
cis-1,2-Dichloroethylene	CAS 156-59-2	Reportable as part of TURA category "C1-C4 Halogenated Hydrocarbons and Halocarbons Not Otherwise Listed" ("C1-C4 Halogenated NOL")
cis- and *trans*-mixture	CAS 540-59-0	TURA listed

Note: The *cis* isomer of DCE is not commonly used in commercial cleaning solvents; it is provided here for information only.

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