

**TRICHLOROETHYLENE** Trichloroethylene (TCE) is a chemical solvent used primarily in industrial and commercial processes, such as vapor degreasing, and has limited use in some consumer and commercial products, including aerosol degreasers and spot removers.



## IMPACTS ON HUMAN HEALTH

Exposure	Health Hazard <sup>1</sup>	At-Risk Groups Potentially Affected	Approximate Impact
Short-Term (Acute)	Developmental effects (fetal cardiac defects)	Workers and consumers -- including <b>pregnant women</b> and women of reproductive age	<b>45,390 to 106,590</b> workers using vapor degreasers or working nearby are exposed to TCE, <b>including up to 1,066</b> pregnant workers
Long-Term (Chronic)	Cancer (kidney, liver, Non-Hodgkin lymphoma) Developmental effects Non-cancer kidney effects Immunotoxicity Reproductive effects Neurotoxicity Non-cancer liver effects		<b>105,000 to 168,000</b> workers in dry cleaning operations and those working nearby are exposed to TCE, <b>including up to 5,400</b> pregnant women  <b>10,800</b> workers in commercial aerosol degreasing operations and those working nearby as well as <b>22,000</b> consumers using aerosol degreasers and those nearby are exposed to TCE, including <b>900</b> pregnant women

**VAPOR DEGREASING** (up to 14.7% of usage): The process involves heating TCE in a degreasing unit to a hot vapor. The vapor condenses onto parts placed in the unit, and carries contaminants away from those parts as it beads and then drips off.

**AEROSOL DEGREASING AND SPOT CLEANING** (up to 1.7% of usage): In aerosol degreasing, the TCE aerosol spray is applied from a pressurized can to remove residual contaminants from parts, such as in a repair shop. Dry cleaning facilities also use TCE to “pre-spot” stained fabrics before they are placed in dry cleaning machines to remove oily stains.

**EPA’S PROPOSED ACTION** On December 16, 2016, EPA proposed a determination that using TCE for aerosol degreasing as well as for spot cleaning at dry cleaners “presents an unreasonable risk to human health.”<sup>2</sup> EPA proposed a ban under the Toxic Substances Control Act (TSCA) on the commercial use of TCE for aerosol degreasing and for spot cleaning in dry cleaning facilities, and on TCE’s “manufacture, processing, and distribution in commerce” for these uses. On January 19, 2017, EPA proposed to prohibit these activities as related to vapor degreasing based on similar concerns.<sup>3</sup>

**ALTERNATIVES ARE AVAILABLE** In its proposed rules, EPA listed several alternatives to each use of TCE. For aerosol degreasing, there are alternative formulations that are acetone-, citrus terpene-, hydrocarbon-, and water-based. Similarly, comparably effective substitutes for TCE’s use in dry cleaning include water-based cleaners, methyl esters (soy) cleaners, hydrocarbon/mineral spirits, and glycol ethers. Alternatives to TCE use in vapor degreasing include aqueous cleaning systems and other cleaning solvents such as soy-based products. Unfortunately, in both rules, EPA also discusses methylene chloride, 1-bromopropane, and/or perchloroethylene, despite the known toxicity of these chemicals.

**ARE FACILITIES MOVING TOWARD SAFER ALTERNATIVES?** Representatives of 33 industrial facilities responded to Safer Chemicals, Healthy Families’ inquiry or publicly communicated to EPA to confirm that they use TCE in vapor degreasing processes. We graded the responses as discussed in our report, *Toxic Vaping*.<sup>4</sup>

In summary:

- ➔ 1 facility received an A, for planning to phase out TCE in vapor degreasing and move to a safer alternative
- ➔ 4 facilities received a B, for planning to phase out TCE in vapor degreasing (or already phased out) but toxicity of alternative is unknown
- ➔ 12 facilities received a C, for searching for safer substitutes
- ➔ 16 facilities received a D, since they provided no indication they are actively searching for substitutes, or they already moved to a regrettable substitute

<sup>1</sup> U.S. EPA, TSCA Work Plan Chemical Risk Assessment, Trichloroethylene: Degreasing, Spot Cleaning and Arts & Crafts Uses, CASRN: 79-01-6, EPA Document # 740-R1-4002, June 2014, [https://www.epa.gov/sites/production/files/2014-11/documents/tce\\_opptworkplanchemra\\_final\\_062414.pdf](https://www.epa.gov/sites/production/files/2014-11/documents/tce_opptworkplanchemra_final_062414.pdf)

<sup>2</sup> Trichloroethylene; Regulation of Certain Uses Under TSCA Section 6(a), 81 Fed Reg 91592, (proposed December 16, 2016), <https://www.regulations.gov/document?D=EPA-HQ-OPPT-2016-0163-0001>

<sup>3</sup> Trichloroethylene (TCE); Regulation of Use in Vapor Degreasing Under TSCA Section 6(a), 82 Fed. Reg. 7432, (proposed January 19, 2017), <https://www.regulations.gov/document?D=EPA-HQ-OPPT-2016-0387-0001>

<sup>4</sup> See [http://saferchemicals.org/sc/wp-content/uploads/2017/12/saferchemicals.org\\_toxic\\_vaping\\_report\\_12.17.pdf](http://saferchemicals.org/sc/wp-content/uploads/2017/12/saferchemicals.org_toxic_vaping_report_12.17.pdf)