Preliminary Information on Manufacturing, Processing, Distribution, Use, and Disposal:

Trichloroethylene

CASRN: 79-01-6

February 2017

Support document for Docket EPA-HQ-OPPT-2016-0737
This document provides a preliminary public summary of available information collected by EPA’s Office of Pollution Prevention and Toxics (OPPT) in the Office of Chemical Safety and Pollution Prevention (OCSPP) on the manufacturing (including importing), processing, distribution in commerce, use, and disposal of this chemical. This is based on existing data available to EPA, including information collected under the Chemical Data Reporting rule, Toxics Release Inventory, information from other Agency databases, other U.S. Government agencies, publicly available information from states, and a review of published literature. In addition, the document includes information reported to EPA by producers and users of the chemical in the United States and in other countries.

This preliminary use information and any additional use information received in the docket by March 15, 2017 will inform efforts to develop the scope of the chemical risk evaluation required under section 6(b)(4) of the Toxic Substances Control Act, and will inform any risk management efforts following risk evaluation.

Mention of trade names in this document does not constitute endorsement by EPA. To verify products or articles containing this chemical currently in commerce, EPA has identified several examples. Any lists are provided for informational purposes only. EPA and its employees do not endorse any of the products or companies.

This document does not contain confidential business information (CBI).
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CONTACT

Toni Krasnic, Chemical Control Division, Office of Pollution Prevention and Toxics. 202-564-0984, krasnic.toni@epa.gov

Docket: EPA-HQ-OPPT-2016-0737
1. Manufacturing (Including Importing)

For the 2016 Chemical Data Reporting (CDR) period, non-confidential data reported indicate there are 13 manufacturers (including importers) of trichloroethylene (TCE) in the United States\(^1,\)\(^2\). The total volume (in lbs.) of TCE manufactured (including imported) in the United States in 2012 was 220,536,812; in 2013: 198,987,532; in 2014: 191,996,578; in 2015: 171,929,400.

For the 2015 Toxics Release Inventory (TRI), for all reported uses, 20 facilities reported releases of TCE\(^3\). Of those sites, 17 reported manufacture in the United States, 3 reported import, 6 reported on site use/processing, and 118 reported other uses (some sites reported in multiple categories)\(^4\). A total of 202.5 million lbs. of TCE were manufactured in the United States or imported into the United States.

\(^1\) Manufacturers (including importers) are required to report under CDR if they meet certain production volume thresholds, generally 25,000 lb or more of a chemical substance at any single site. Reporting is triggered if the annual reporting threshold is met during any of the calendar years since the last principal reporting year. In general, the reporting threshold remains 25,000 lb per site. However, a reduced reporting threshold (2,500 lb) now applies to chemical substances subject to certain TSCA actions. [https://www.epa.gov/chemical-data-reporting/how-report-under-chemical-data-reporting](https://www.epa.gov/chemical-data-reporting/how-report-under-chemical-data-reporting)

\(^2\) Manufacture in the context of CDR means to manufacture, produce, or import for commercial purposes. Manufacture includes the extraction, for commercial purposes, of a component chemical substance from a previously existing chemical substance or complex combination of chemical substances. (40 CFR 711.3) [https://www.epa.gov/sites/production/files/2015-12/documents/cdr_fact_sheet_importers_final_dec2015_0.pdf](https://www.epa.gov/sites/production/files/2015-12/documents/cdr_fact_sheet_importers_final_dec2015_0.pdf)

\(^3\) A facility must report to the TRI program if it meets all three of the following criteria: 1) is in a specific industry sector, 2) employs 10 or more full-time equivalent employees, and 3) manufactures, processes, or otherwise uses a TRI-listed chemical in quantities above applicable threshold levels for a given chemical in a given year. [https://www.epa.gov/toxics-release-inventory-tri-program/basics-tri-reporting](https://www.epa.gov/toxics-release-inventory-tri-program/basics-tri-reporting)

\(^4\) The term "process" in the context of CDR and TRI means the preparation of a chemical substance or mixture, after its manufacture, for distribution in commerce—

(A) in the same form or physical state as, or in a different form or physical state from, that in which it was received by the person so preparing such substance or mixture, or

(B) as part of an article containing the chemical substance or mixture. [http://uscode.house.gov/view.xhtml?path=/prelim@title15/chapter53&edition=prelim](http://uscode.house.gov/view.xhtml?path=/prelim@title15/chapter53&edition=prelim)

The term “otherwise use” under TRI means any use of an EPCRA Section 313 chemical, including an EPCRA Section 313 chemical contained in a mixture or other trade name product or waste, that is not covered by the terms manufacture or process. See the definition of “otherwise use” for additional details on applicability of otherwise use with regard to disposal, stabilization, and treatment for destruction. [https://www.epa.gov/sites/production/files/2016-01/documents/ry_2015_tri_reporting_forms_and_instructions.pdf](https://www.epa.gov/sites/production/files/2016-01/documents/ry_2015_tri_reporting_forms_and_instructions.pdf)
that year. Of that total, 111,357,182 lbs. of TCE were manufactured in the United States and 91,183,302 lbs. were imported.

2. Processing

Since 2012, based on information reported to TRI, the number of facilities that process TCE has declined.

As reported to TRI for 2012, 38 facilities used TCE as a formulation component, 33 facilities processed TCE by repackaging the chemical, 28 facilities used TCE as a manufacturing aid, and 1,113 facilities used TCE for ancillary uses, such as degreasing. Based on information reported to TRI for 2014, the number of users of TCE has significantly decreased since 2012: 24 facilities used TCE as a formulation component, 20 facilities processed TCE by repackaging the chemical, 20 facilities used TCE as a manufacturing aid, and 97 facilities used TCE for ancillary uses, such as degreasing.

Based on information reported to TRI for 2015, the number of users of TCE continued to decrease from 2014: 22 facilities used TCE as a formulation component, 17 facilities processed TCE by repackaging the chemical, 21 facilities used TCE as a manufacturing aid, and 90 facilities used TCE for ancillary uses, such as degreasing.

3. Products and Articles

EPA has identified the following types of products currently in commerce. This list is provided for informational purposes only. EPA and its employees do not endorse any of the products or companies.

Products containing TCE include:
- Aerosol spray degreasers
- Spot cleaners
- Cleaning wipes
- Carpet cleaner
- Hoof polishes
- Pepper spray
- Mirror edge sealants
- Sealants
- Adhesive
- Toner aid
- Penetrating lubricant
- Tap and die fluid
- Mold release
- Lace wig and hair extension glues
Aerosol Spray Degreasers

EPA identified 16 different aerosol spray degreaser products that contain TCE, blended by 6 different firms.

Table 1. List of Products – Aerosol Spray Degreasers

<table>
<thead>
<tr>
<th>Trade name</th>
<th>Use of the Product</th>
<th>% by weight of chemical</th>
<th>Link to references, SDS or industry information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electro Blast</td>
<td>Aerosol degreasing</td>
<td>90-100%</td>
<td><a href="http://procheminc.com/proddocs/ELECTRO%20BLAST%201649%20SDS_1.pdf">http://procheminc.com/proddocs/ELECTRO%20BLAST%201649%20SDS_1.pdf</a></td>
</tr>
<tr>
<td>Electro Solv</td>
<td>Aerosol degreasing</td>
<td>90-100%</td>
<td><a href="http://procheminc.com/proddocs/ELECTRO%20SOLV%201616%20SDS_1.pdf">http://procheminc.com/proddocs/ELECTRO%20SOLV%201616%20SDS_1.pdf</a></td>
</tr>
<tr>
<td>Pro Tools NF Solvent Degreaser</td>
<td>Aerosol degreasing</td>
<td>60-100%</td>
<td><a href="http://procheminc.com/proddocs/PRO%20TOOLS%20NF%2OSOLVENT%20DEGREASER%201494%20SDS_2.pdf">http://procheminc.com/proddocs/PRO%20TOOLS%20NF%2OSOLVENT%20DEGREASER%201494%20SDS_2.pdf</a></td>
</tr>
<tr>
<td>Parts Cleaner</td>
<td>Aerosol degreasing</td>
<td>45-55%</td>
<td><a href="https://sds.zepinc.com">https://sds.zepinc.com</a></td>
</tr>
</tbody>
</table>
**Spot Cleaning Products**

EPA identified 11 spot cleaning products blended by 7 different firms.

Table 2. List of Products – Spot cleaning

<table>
<thead>
<tr>
<th>Trade name</th>
<th>Use of the Product</th>
<th>% by weight of chemical</th>
<th>Link to references, SDS or industry information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Free Electrical Degreaser</td>
<td>Aerosol degreasing</td>
<td>98%</td>
<td><a href="http://www.packagesupply.net/private/msds/streets/picrin.pdf">http://www.packagesupply.net/private/msds/streets/picrin.pdf</a></td>
</tr>
<tr>
<td>Chlorinated Brake &amp; Parts Cleaner - Aerosol</td>
<td>Aerosol degreasing</td>
<td>98%</td>
<td><a href="http://www.nortonsupply.com/msds/streets/2-1formula.pdf">http://www.nortonsupply.com/msds/streets/2-1formula.pdf</a></td>
</tr>
</tbody>
</table>
The following table lists other products containing TCE that EPA has identified.

**Table 3. List of Products**

<table>
<thead>
<tr>
<th>Trade name</th>
<th>Use of the Product</th>
<th>% by weight of chemical</th>
<th>Link to references, SDS or industry information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tacky</td>
<td>Aerosol belt dressing</td>
<td>20-40%</td>
<td><a href="http://procheminc.com/proddocs/TACKY%201284%20SDS_2.pdf">http://procheminc.com/proddocs/TACKY%201284%20SDS_2.pdf</a></td>
</tr>
<tr>
<td>Truex</td>
<td>Aerosol open gear &amp; cable lubricant</td>
<td>10-20%</td>
<td><a href="http://procheminc.com/proddocs/TRUEX%201761%20SDS_1.pdf">http://procheminc.com/proddocs/TRUEX%201761%20SDS_1.pdf</a></td>
</tr>
<tr>
<td>Pro Tools MP Penetrant Lubricant</td>
<td>Multipurpose penetrant, lubricant, and demoisturant</td>
<td>5-10%</td>
<td><a href="http://procheminc.com/proddocs/PRO%20TOOLS%20MP%20PENETRANT%20LUBRICANT%201496%20SDS_1.pdf">http://procheminc.com/proddocs/PRO%20TOOLS%20MP%20PENETRANT%20LUBRICANT%201496%20SDS_1.pdf</a></td>
</tr>
<tr>
<td>NU-Blast</td>
<td>Coil cleaner/degreaser</td>
<td>95-98%</td>
<td><a href="http://www.nucalgon.com/assets/SDS/English/4290-75_SDS_ENG.pdf">http://www.nucalgon.com/assets/SDS/English/4290-75_SDS_ENG.pdf</a></td>
</tr>
<tr>
<td>Gun Wash</td>
<td>Solvent/degreaser</td>
<td>97%</td>
<td><a href="http://www.airduster.com/MSDS/GW-007-027-MSDS.htm">http://www.airduster.com/MSDS/GW-007-027-MSDS.htm</a></td>
</tr>
</tbody>
</table>
Past and Potential Uses

The following table lists products that used to contain TCE but have been reformulated to no longer contain TCE.

Table 4. List of Products

<table>
<thead>
<tr>
<th>Trade name</th>
<th>Use of the Product</th>
<th>% by weight of chemical</th>
<th>Link to references, SDS or industry information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy Duty Degreaser</td>
<td></td>
<td>0</td>
<td><a href="http://docs.crcindustries.com/msds/3095.pdf">http://docs.crcindustries.com/msds/3095.pdf</a></td>
</tr>
<tr>
<td>LU 201</td>
<td>Open gear &amp; wire rope lubricant aerosol</td>
<td>0</td>
<td><a href="http://www.paintdocs.com/docs/webPDF.jsp?SITEID=SO&amp;doctype=SDS&amp;prodno=S00201000&amp;lang=2">http://www.paintdocs.com/docs/webPDF.jsp?SITEID=SO&amp;doctype=SDS&amp;prodno=S00201000&amp;lang=2</a></td>
</tr>
<tr>
<td>Coil Cleaner</td>
<td></td>
<td>0</td>
<td><a href="http://docs.crcindustries.com/msds/3195.pdf">http://docs.crcindustries.com/msds/3195.pdf</a></td>
</tr>
<tr>
<td>Film Cleaner</td>
<td>Film cleaner</td>
<td>0</td>
<td><a href="https://www.emsdiasum.com/microscopy/technical/msds/74317.pdf">https://www.emsdiasum.com/microscopy/technical/msds/74317.pdf</a></td>
</tr>
<tr>
<td>201</td>
<td>Plastic spray clear with UV inhibitors</td>
<td>0</td>
<td><a href="http://www.spraywayinc.com/sites/all/themes/theme687/msds/sw201.pdf">http://www.spraywayinc.com/sites/all/themes/theme687/msds/sw201.pdf</a></td>
</tr>
</tbody>
</table>

4. Distribution (Includes Retailers)

Information on the distribution of TCE is limited. Based on information reported to TRI for 2015, 4 facilities manufacture TCE for sale or distribution. Based on information reported to CDR for 2016, 5 facilities manufacture TCE for wholesale and retail trade.

5. Use

TCE has historically had a wide range of uses drawn from various markets, including intermediate chemicals (for refrigerant and polyvinyl chloride manufacture), industrial and commercial solvents, pharmaceuticals, insecticides, fumigant, textiles (processing and flame retardants), adhesives, and paints (as diluent). As of 2011, the majority of United States consumption of TCE is attributable to two specific uses. An estimated 84 percent of TCE is used as an intermediate in manufacturing hydrofluorocarbon (HFC-134a), and as an alternative refrigerant to CFC-12, which was
banned under the Montreal Protocol in 1996. An estimated 15 percent of TCE is used as a degreasing solvent. The remaining of manufacture volume is attributed to other uses5.

**Industrial and Commercial Uses**

TCE is used as a solvent because it is effective in dissolving fats, grease, waxes, and a large variety of natural and synthetic substances. It is non-corrosive, nonflammable, and easy to recycle.

These uses include:

- Vapor degreasing (already assessed by EPA)
- Aerosol degreaser (already assessed by EPA)
- Spot cleaner in dry cleaning (already assessed by EPA)
- Spray-on protective coating (already assessed by EPA)
- Intermediate in refrigerant manufacture (HFC-134a)
- Cold cleaning – wipes, batch cleaning
- Carpet cleaner/spot cleaner
- Cleaners and solvent degreasers
- Hoof polishes
- Pepper spray
- Mirror edge sealants
- Sealants
- Carpet cleaner/spot cleaner
- Adhesive
- Toner aid
- Textile scouring
- Penetrating lubricant
- Tap and die fluid
- Mold release
- Lace wig and hair extension glues
- Wool, cotton scouring

**Consumer Uses**

Products containing TCE have commercial and consumer uses. Consumer uses of TCE are similar to commercial use but occurs in consumer settings. The products used in consumer settings are typically the same as those used in commercial settings.

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5 In December 2016 and January 2017, EPA proposed prohibitions on the use of TCE in commercial and consumer aerosol degreasing, as a spot cleaner in dry cleaning, and in vapor degreasing (81 FR 91592, December 16, 2016 and 82 FR 7432, January 19, 2017).
6. Disposal of Waste and Recycling/Recovery

Some facilities have reported to TRI that they reclaim TCE on-site and then reuse it. This on-site recycling process occurs several times until the solvent can no longer be used.

According to TRI, in 2015, 75,736,748 lbs. of TCE were recycled onsite, while 353,673 lbs. were recycled at facilities offsite, equaling a total of 76,090,421 lbs. recycled.

Land disposal of halogenated organic solvents, such as TCE, is restricted (53 FR 25760). Proper authorization must be obtained from federal, state, and local authorities for land disposal of TCE or TCE-containing materials.

According to TRI, in 2015, 91,183,302 lbs. of TCE were transferred offsite to landfills and/or other treatment/disposal facilities, and 1,928,867 lbs. were released to air, water, and land.

USEFUL TYPES OF INFORMATION

This document presents a summary of information currently available to EPA on this chemical. To more fully characterize the manufacturing, processing, distribution, disposal, and use of this chemical, and to inform the development of the scoping document for this chemical, EPA is interested in obtaining information on:

- the functional uses for this chemical;
- what types of products contain this chemical;
- which industry sectors use this chemical;
- what volume of the chemical is used;
- which uses have been discontinued or phased out;
- exposure scenarios for this chemical; and
- in which articles this chemical is found.
APPENDIX: SOURCES CONSULTED

- U.S. EPA Chemical Inventory
  https://www.epa.gov/tsca-inventory
- U.S. EPA ChemView
  https://java.epa.gov/chemview
- TRI P2 information
  https://www.epa.gov/toxics-release-inventory-tri-program/pollution-prevention-p2-and-tri
- U.S. EPA HPV HC (access through Chemical Data Access Tool – CDAT)
  https://java.epa.gov/oppt_chemical_search/
- U.S. EPA HPVIS and HPV HC (access through Chemical Data Access Tool – CDAT)
  https://java.epa.gov/oppt_chemical_search/
- DfE Alternatives Assessments
  https://www.epa.gov/saferchoice/design-environment-alternatives-assessments
- Safer Chemical Ingredients List
  https://www.epa.gov/saferchoice/safer-ingredients
- Green Chemistry awards
  https://www.epa.gov/greenchemistry/presidential-green-chemistry-challenge-winners
- Greener products and services
  https://www.epa.gov/greenerproducts/identify-greener-products-and-services
- Pollution Prevention
  https://www.epa.gov/p2/pollution-prevention-case-studies
  https://www.epa.gov/p2/grant-programs-pollution-prevention#sra
  https://www.epa.gov/p2/pollution-prevention-tools-and-calculators
- U.S. EPA InertFinder
  https://iaspub.epa.gov/apex/pesticides/f?p=101:1::
- U.S. EPA Pesticide Chemical Search
  https://iaspub.epa.gov/apex/pesticides/f?p=CHEMICALSEARCH:1::NO:1::
- U.S. EPA Endocrine Disruptor Screening Program
  https://www.epa.gov/ingredients-used-pesticide-products/endocrine-disruptor-screening-program-tier-1-assessments
- U.S. EPA Hazardous Waste
  https://www.epa.gov/hw/learn-basics-hazardous-waste#regulations
- U.S. EPA Superfund chemical data matrix
- U.S. EPA Hazardous Air Pollutants
  https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications
- U.S. EPA Significant New Alternatives Policy (SNAP)
  https://www.epa.gov/snap
- U.S. EPA Volatile Organic Compounds
  https://www.epa.gov/indoor-air-quality-iaq/technical-overview-volatile-organic-compounds#definition
- U.S. EPA Toxic and priority pollutants under the Clean Water Act
  https://www.epa.gov/eg/toxic-and-priority-pollutants-under-clean-water-act#toxic
• U.S. EPA Contaminant Candidate list under the Safe Drinking Water Act
  https://www.epa.gov/ccl/contaminant-candidate-list-3-ccl-3#chemical-list
• U.S. EPA IRIS Assessment
  https://cfpub.epa.gov/ncea/iris2/atoz.cfm
• U.S. EPA SRS
  https://iaspub.epa.gov/sor_internet/registry/substreg/searchandretrieve/substancesearch/search.do
• U.S. EPA Chemical and Product Categories (CPCat) Database
  https://actor.epa.gov/cpcat/faces/home.xhtml
• U.S. National Library of Medicine ChemIDplus
• U.S. National Library of Medicine Hazardous Substance Data Bank (HSBD)
• U.S. Department of Health & Human Services Household Products Database
• OSHA Chemical Hazards and Toxic Substances
• NIOSH Workplace Safety and Health Topics Chemicals
  http://www.cdc.gov/niosh/topics/chemical.html
• NIOSH Pocket Guide to Chemical Hazards
  http://www.cdc.gov/niosh/npg/npgdcas.html
• CPSC Chemicals
• CPSC FHSA
• Food and Drug Administration List of Databases
  http://www.fda.gov/ForIndustry/FDABasicsforIndustry/ucm234631.htm
• NTP (National Toxicology Program) Substances studied by NTP
  http://ntpsearch.niehs.nih.gov/?e=True&ContentType=Testing+Status
• Department of Energy Protective Action Criteria Database
• California Department of Toxic Substances Control Toxics in Products
  http://www.dtsc.ca.gov/PollutionPrevention/ToxicsInProducts/index.cfm
  http://www.dtsc.ca.gov/SCP/CandidateChemicalsList.cfm
• California Office of Environmental Health Hazard Assessment Proposition 65
  http://oehha.ca.gov/proposition-65/chemicals
  http://oehha.ca.gov/proposition-65/proposition-65-list
• California Office of Environmental Health Hazard Assessment Biomonitoring
  http://biomonitoring.ca.gov/chemicals
• California permissible exposure limits for chemical contaminants
  https://www.dir.ca.gov/title8/5155table_ac1.html
California hazardous substance list
https://www.dir.ca.gov/title8/339.html

California Safe Cosmetics Program – list of chemical agents known or suspected to cause cancer or developmental or other reproductive harm.
http://www.cdph.ca.gov/programs/cosmetics/Pages/default.aspx
https://safecosmetics.cdph.ca.gov/search/Default.aspx

Maine chemicals of high concern
http://www.maine.gov/dep/safechem/highconcern/

Massachusetts Toxics Use Reduction Act (TURA) (link includes a link to Higher hazard substances list)

Massachusetts Complete list of TURA chemicals

Lowell Center for Sustainable Production Chemical, Policy and Science Initiative
http://www.chemicalspolicy.org/chemicalspolicy.us.state.database.php

Minnesota Department of Health Toxic Free Kids Act Chemicals of High Concern
http://www.health.state.mn.us/divs/eh/hazardous/topics/toxfreekids/highconcern.html

Michigan Environmental Health Topics
http://www.michigan.gov/mdhhs/0,5885,7-339-71548_54783_54784_74881-13050--,00.html

New Hampshire Regulated Toxic Air Pollutants

New Jersey Right to Know Hazardous Substances
http://web.doh.state.nj.us/rtkhsfs/rtkhsl.aspx

Oregon Priority Persistent Pollutants (in water)
http://www.deq.state.or.us/wq/SB737/

Oregon Pollutant Profiles
http://www.deq.state.or.us/wq/SB737/docs/LegRpAtt420100601.pdf

Oregon Reducing Toxics in Oregon
http://www.oregon.gov/deq/Pages/ToxicsReduction.aspx

Oregon Chemicals of Concern for Children’s Health

Pennsylvania Department of Labor and Industry Hazardous Substance List
http://www.pacode.com/secure/data/034/chapter323/chap323toc.html

Rhode Island Air Resources – Air Toxics
http://www.dem.ri.gov/pubs/regs/regs/air/air22_08.pdf

Vermont Chemical Disclosure Program for Children’s Products
http://www.healthvermont.gov/enviro/chemical/cdp.aspx

Washington Chemicals of High Concern to Children

Washington Children’s Safe Products Act
http://apps.leg.wa.gov/RCW/default.aspx?cite=70.240
- Washington Department of Labor & Industries SHARP Publications
  http://www.lni.wa.gov/Safety/Research/Pubs/default.asp
- National Conference of State Legislatures
- Canada Chemicals Portal
  http://chemicalsubstanceschimiques.gc.ca/index-eng.php
- EU ECHA website
  https://echa.europa.eu/
- Australia NICNAS Chemical Information
- Japan Chemical Risk Information Platform (CHIRP)
- OECD eChemPortal
  http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- Stockholm Convention on Persistent Organic Pollutants
  http://chm.pops.int/TheConvention/ThePOPs/ListingofPOPs/tabid/2509/Default.aspx
- WHO IPCS (UN)
  http://www.who.int/ipcs/en/
- Other – worker protection information
- DeLima Associates Consumer Product Information Database (CPID)
  https://www.whatsinproducts.com/chemicals/index/1
- SRC FatePointers Search Module PHYSPROP
  http://esc.syrres.com/fatepointer/search.asp
  Product and company websites