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

Carbon Tetrachloride

CASRN: 56-23-5

February 2017

Support document for Docket EPA-HQ-OPPT-2016-0733
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).
1. Manufacturing (Including Importing)

Carbon tetrachloride was a popular aerosol propellant in the 1950’s and 1960’s, which contributed to a growth rate of 10.7% per year from 1960-1970 for the manufacture of carbon tetrachloride. This rate decreased to 7.2% per year from 1970-1974, when other forms of propellants became commercially available (Holbrook 1991). Annual production at this time exceeded one billion lbs. From 1974 to 1994, manufacture of carbon tetrachloride decreased at approximately 8% a year (Chem Mark Rep 1995; Holbrook 1991). This decline is attributed to the adoption of the Montreal Protocol to reduce environmental concentrations of ozone-depleting substances (ODS) (including carbon tetrachloride), and to the provisions of Title VI of the Clean Air Act Amendments of 1990 addressing these chemicals. The regulation called for reduction to 15% of 1989 production levels by 1995 and a complete phase-out of carbon tetrachloride production for non-feedstock uses by 2000. EPA allocated a baseline production allowance of about 138 million pounds (63,000 metric tons) of carbon tetrachloride, apportioned among the eight U.S. companies producing the chemical in 1989 (EPA 1991a). There has also been a drop-off in both imports and exports for carbon tetrachloride.

Figure 1 shows the production trend of carbon tetrachloride from the early 1900’s until 1990, with a clear peak production in 1970.

For the 2012 Chemical Data Reporting (CDR) period, data reported indicate that nine sites manufacture (including import) carbon tetrachloride in the United States\(^1,2\). The total volume (in lbs.) of carbon tetrachloride manufactured (including imported) in the United States in 2010 was 138,835,158; in 2011: 149,927,241.

For the 2016 CDR period, 9 sites reported domestic manufacture or import of carbon tetrachloride. The total volume (in lbs.) of carbon tetrachloride manufactured (including imported) in the United States in 2012 was 129,145,698; in 2013: 116,658,281; in 2014: 138,951,153; in 2015: 142,582,067.

This trend indicates that production of carbon tetrachloride in the United States has remained constant over the past 6 years.

For the 2015 Toxics Release Inventory (TRI), 47 sites reported releases of carbon tetrachloride \(^3\). Of these, 28 sites reported production, 3 reported import, and 8 reported processing of carbon tetrachloride\(^4\). A total of 12,671 pounds of carbon tetrachloride were transferred offsite to landfills and/or other treatment/disposal facilities and 139,943 pounds were released to air, water, and land.

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\(^1\) 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)

Similarly, the term “manufacture” in the context of TRI means to produce, prepare, compound, or import an EPCRA Section 313 chemical. The term “manufacture” also includes coincidental production of an EPCRA Section 313 chemical (e.g., as a byproduct or impurity) as a result of the manufacture, processing, otherwise use or disposal of another chemical or mixture of chemicals. [https://www.epa.gov/sites/production/files/documents/ry2012rfi.pdf](https://www.epa.gov/sites/production/files/documents/ry2012rfi.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.

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)
Manufacturing Process

A majority of carbon tetrachloride produced in the United States is produced by the chlorination of a variety of low molecular weight hydrocarbons such as carbon disulfide, methane, ethane, propane, and ethylene dichloride (HSDB 2004). It is also produced by thermal chlorination of methyl chloride (HSDB 2004).


According to TOXNET (A Toxicology Data Network within the National Institutes of Health), methods of manufacturing carbon tetrachloride include:

- Obtained from carbon disulfide and chlorine in the presence of a catalyst or by the chlorination of hydrocarbons.
- Pyrolysis of hexachloroethane
- Methyl chloride + chlorine (thermal chlorination; coproduced with chloroform/methylene chloride)
- Natural gas + hydrogen chloride, anhydrous/oxygen (Lummus oxychlorination process; coproduced with chloroform/methyl chloride/methylene chloride)
- Ethane/propane + chlorine (chlorinolysis; coproduced with perchloroethylene)
- Reaction of sulfur monochloride with carbon disulfide produces carbon tetrachloride
- Interaction of carbon disulfide and chlorine in the presence of iron; (2) chlorination of methane or higher hydrocarbons at 250-400 /deg/ C.

Source: http://toxnet.nlm.nih.gov/cgi-bin/sis/search2/r?dbs+hsdb:@term+@DOCNO+53
2. Processing

Based on publicly available information reported to CDR, TRI, and other sources, carbon tetrachloride is primarily used as chemical feedstock in the synthesis of CFCs, HCFCs, and HFCs, which are often used as refrigerants. For adhesives, carbon tetrachloride is used as a process agent in the manufacture of chlorinate rubber resins. The resulting resins are thermoplastic, odorless, and non-toxic. Carbon tetrachloride is preferred in this process as it is the only solvent not attacked by chlorine.

Current processing of carbon tetrachloride in the United States includes:

- Chemical feedstock, such as for the following chemicals:
  - 1,1,2,2-tetrachloroethene (Perchloroethylene, CAS: 127-18-4)
  - HFC-245fa (1,1,1,3,3-pentafluoropropane, CAS: 460-73-1)
  - HFC-365mfc (1,1,1,3,3-pentafluorobutanebutane CAS: 406-58-6)
  - HFC-236fa (1,1,1,3,3,3-hexafluoropropane CAS: 690-39-1)
  

- Feedstock for chlorofluorocarbon gases (dichlorodifluoromethane (F-12) and trichlorofluoromethane (F-11), which were used in the past as aerosol propellants (Holbrook 1991)

- Use as a processing agent:
  - Elimination of NCl₃ in chlor-alkali production
  - Chlorine recovery by tail gas absorption in chlor-alkali production
  - Production of Chlorinated rubber
  - Production of chlorosulfonated polyolefin (CSM)
    

- All other basic organic chemical manufacturing
- Industrial gas manufacturing

- Processing as a formulation component or repackaging
  - Plastics Material and Resin Manufacturing

Source: [https://java.epa.gov/chemview](https://java.epa.gov/chemview)
3. Products and Articles

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

Table 1. List of Products

<table>
<thead>
<tr>
<th>Trade name</th>
<th>Use of the Product (If Known)</th>
<th>% by weight of chemical</th>
<th>Link to references, SDS or industry information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Tetrachloride</td>
<td>NA</td>
<td>100%</td>
<td><a href="http://cdn.chemservice.com/product/msdsnew/External/English/N-11407%20English%20SDS%20US.pdf">http://cdn.chemservice.com/product/msdsnew/External/English/N-11407%20English%20SDS%20US.pdf</a></td>
</tr>
<tr>
<td>Draeger Tubes™</td>
<td>Used for the measurement of gas concentrations</td>
<td>NA</td>
<td><a href="http://www.hazcat.com/MSDS/MSDSPDF/AllDraeger.pdf">http://www.hazcat.com/MSDS/MSDSPDF/AllDraeger.pdf</a></td>
</tr>
<tr>
<td>HYPALON Synthetic Rubbers</td>
<td>Synthetic rubber – used for insulation and jacketing of wire and cable</td>
<td>&lt;.2%</td>
<td><a href="http://www1.mscdirect.com/MSDS/MSDS0004/63415905-20150718.PDF">http://www1.mscdirect.com/MSDS/MSDS0004/63415905-20150718.PDF</a></td>
</tr>
</tbody>
</table>
| UR51WP511 PRO 5 C/R White Solvent Paint-TT-P-115E, Type III | Traffic paint | <0.1% | https://corpapps.anixter.com/DocLib1/5ZE_X7S2R/$file/DuPontDiscontinuingHyphalonJuneJuly09.pdf%3FopenelementUR51WP511 
<p>| Carbon Tetrachloride | NA | 100% | <a href="https://www.elac.edu/academics/departments/chemistry/chemistryDocuments/docs/C/carbon%20tetrachloride.pdf">https://www.elac.edu/academics/departments/chemistry/chemistryDocuments/docs/C/carbon%20tetrachloride.pdf</a> |
| Prenol, from sea buckthorn (hippophae), 80 mg/ml solution in CCl4 | NA | 95% | <a href="https://www.fishersci.com/shop/msdsproxy?productName=AC290150500&amp;productDescription=PRENOL%2CFROM+SEA+BUCKTHOR+50MG&amp;catNo=AC290150500&amp;vendorId=VN00032119&amp;storeId=10652">https://www.fishersci.com/shop/msdsproxy?productName=AC290150500&amp;productDescription=PRENOL%2CFROM+SEA+BUCKTHOR+50MG&amp;catNo=AC290150500&amp;vendorId=VN00032119&amp;storeId=10652</a> |</p>
<table>
<thead>
<tr>
<th>Trade name</th>
<th>Use of the Product (If Known)</th>
<th>% by weight of chemical</th>
<th>Link to references, SDS or industry information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloracoat Rubber Based Paint</td>
<td>Coating compound/ Surface coating/ paint</td>
<td>&lt;2.5%</td>
<td><a href="https://goldenc.com/Documents/SDSSheets/Paint/CChloracoat_Chlorinated_Rubber_Paint.pdf">https://goldenc.com/Documents/SDSSheets/Paint/CChloracoat_Chlorinated_Rubber_Paint.pdf</a></td>
</tr>
<tr>
<td>FOSTER 60-38</td>
<td>Coating</td>
<td>0.1-1%</td>
<td><a href="http://www.fosterproducts.com/docHandler.aspx?docid=11d0c75d-4540-4795-826e-4b6698483866">http://www.fosterproducts.com/docHandler.aspx?docid=11d0c75d-4540-4795-826e-4b6698483866</a></td>
</tr>
<tr>
<td>LOCTITE® H472O/H4710™ Structural Adhesive Speedbonder Part A</td>
<td>Adhesive</td>
<td>&lt;1%</td>
<td><a href="http://www.rshughes.com/wm/p/wm-asis/e769b70dd3388fab28bce0693d18e75cd5c10c100.pdf">http://www.rshughes.com/wm/p/wm-asis/e769b70dd3388fab28bce0693d18e75cd5c10c100.pdf</a></td>
</tr>
<tr>
<td>Loctite Plastix Bonder Epoxy - PART A</td>
<td>Plastic adhesive</td>
<td>&lt;1%</td>
<td><a href="https://www.whatsinproducts.com/brands/show_mdsds/1/10506">https://www.whatsinproducts.com/brands/show_mdsds/1/10506</a></td>
</tr>
<tr>
<td>LOC PLASTIC BONDR SYR 8P PTA - resin</td>
<td>Plastic adhesive</td>
<td>&lt;1%</td>
<td><a href="https://www.whatsinproducts.com/brands/show_mdsds/1/15340">https://www.whatsinproducts.com/brands/show_mdsds/1/15340</a></td>
</tr>
<tr>
<td>Depend(R) ODC-Free 330 Adhesive</td>
<td>Structural adhesive</td>
<td>&lt;.1%</td>
<td><a href="http://www.stiweb.com/downloadDataSheets/CMC">http://www.stiweb.com/downloadDataSheets/CMC</a> P211msds.pdf</td>
</tr>
<tr>
<td>Chlorinated Rubber (surface coating paint)</td>
<td>Coating</td>
<td>&lt;2.5%</td>
<td><a href="http://www.hmgcoatings.com/pdfs/MSDS/topcoats%20and%20wood%20stains/Chlorinated%20Rubber%20Lead%20Free%20MSDS.pdf">http://www.hmgcoatings.com/pdfs/MSDS/topcoats%20and%20wood%20stains/Chlorinated%20Rubber%20Lead%20Free%20MSDS.pdf</a></td>
</tr>
<tr>
<td>Devcon High Strength Plastic Welder</td>
<td>Paste- arts and crafts (consumer use)</td>
<td>&lt;1%</td>
<td><a href="https://www.whatsinproducts.com/brands/show_mdsds/1/11641">https://www.whatsinproducts.com/brands/show_mdsds/1/11641</a></td>
</tr>
<tr>
<td>18 oz Brake Sav (red/blue)</td>
<td>Brake cleaner</td>
<td>0.1-1%</td>
<td><a href="http://www.kaylinecompany.com/sds/K40.pdf">http://www.kaylinecompany.com/sds/K40.pdf</a></td>
</tr>
<tr>
<td>Epoxy Plastic Bonder-Old Product</td>
<td>Arts &amp; Crafts</td>
<td>0.1-1 (Part A)</td>
<td><a href="http://173.236.248.140/cpid/brands/show_mdsds/1/10506">http://173.236.248.140/cpid/brands/show_mdsds/1/10506</a></td>
</tr>
<tr>
<td>Epoxy Plastic bonder – 2014</td>
<td>NA</td>
<td>0.1-1.0 (Resin)</td>
<td><a href="http://173.236.248.140/cpid/brands/show_mdsds/1/15340">http://173.236.248.140/cpid/brands/show_mdsds/1/15340</a></td>
</tr>
<tr>
<td>Trade name</td>
<td>Use of the Product (If Known)</td>
<td>% by weight of chemical</td>
<td>Link to references, SDS or industry information</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------</td>
<td>-------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Standard reference Material</td>
<td>Intended for the calibration of instrumentation and validation of methods for VOC determinations</td>
<td>1%</td>
<td><a href="https://www-s.nist.gov/m-srmors/msds/3006-MSDS.pdf">https://www-s.nist.gov/m-srmors/msds/3006-MSDS.pdf</a></td>
</tr>
<tr>
<td>Perchloroethylene All Grades</td>
<td>“Petroleum industry, Refrigerant manufacturing, metal cleaning, paint stripping, Aerosol carrier” -Carbon tetrachloride is used as a feedstock chemical to produce PERC</td>
<td>&lt;0.45%</td>
<td><a href="http://www.ppe.com/msds/MRS-3.PDF">http://www.ppe.com/msds/MRS-3.PDF</a></td>
</tr>
<tr>
<td>Parks PRO STRIPPER</td>
<td>Paint remover</td>
<td>&lt;1 ppm</td>
<td><a href="https://www.menards.com/msds/101357_001.pdf">https://www.menards.com/msds/101357_001.pdf</a></td>
</tr>
<tr>
<td>DYNA-BRAKE</td>
<td>Solvent Mixture</td>
<td>0.1-1%</td>
<td><a href="https://pass.partsmaster.com/MSDS/6228.pdf">https://pass.partsmaster.com/MSDS/6228.pdf</a></td>
</tr>
<tr>
<td>Trim/Detail Adhesive (Kit with Activator)</td>
<td>Auto Products</td>
<td>0.01-0.1</td>
<td>Reference: <a href="https://hp.nlm.nih.gov/cgi-bin/household/search?queryx=56-23-5&amp;tbl=TblChemicals&amp;prodcat=all">https://hp.nlm.nih.gov/cgi-bin/household/search?queryx=56-23-5&amp;tbl=TblChemicals&amp;prodcat=all</a></td>
</tr>
<tr>
<td>CR PREMIUM LINE PAINT YELLOW</td>
<td>Solvent-borne, line-marking paint</td>
<td>&lt;1%</td>
<td><a href="https://www.seton.co.uk/media/cms/files/stuk/DM_EU_TDS_00162_std.lang.all.pdf">https://www.seton.co.uk/media/cms/files/stuk/DM_EU_TDS_00162_std.lang.all.pdf</a></td>
</tr>
<tr>
<td>Plastic Bonder</td>
<td>NA</td>
<td>&lt;0.05</td>
<td>Reference: <a href="https://hp.nlm.nih.gov/cgi-bin/household/search?queryx=56-23-5&amp;tbl=TblChemicals&amp;prodcat=all">https://hp.nlm.nih.gov/cgi-bin/household/search?queryx=56-23-5&amp;tbl=TblChemicals&amp;prodcat=all</a></td>
</tr>
<tr>
<td>30024 / TCLP VOA Mix</td>
<td>NA</td>
<td>0%</td>
<td><a href="http://www.restek.com/documentation/msds/30024_ukeng.pdf">http://www.restek.com/documentation/msds/30024_ukeng.pdf</a></td>
</tr>
<tr>
<td>30259 / Carbon tetrachloride Standard</td>
<td>NA</td>
<td>0%</td>
<td><a href="http://www.restek.com/documentation/msds/30259_useng.pdf">http://www.restek.com/documentation/msds/30259_useng.pdf</a></td>
</tr>
<tr>
<td>Class 1 Residual Solvent Mixture</td>
<td>NA</td>
<td>2%</td>
<td><a href="http://www.restek.com/documentation/msds/3627_9_useng.pdf">http://www.restek.com/documentation/msds/3627_9_useng.pdf</a></td>
</tr>
<tr>
<td>Carbon Tetrachloride</td>
<td>NA</td>
<td>100%</td>
<td><a href="http://www.sciencelab.com/msds.php?msdsId=9927342">http://www.sciencelab.com/msds.php?msdsId=9927342</a></td>
</tr>
<tr>
<td>39537 Weld Bond Adhesive</td>
<td>Adhesive</td>
<td>&lt;2.5%</td>
<td><a href="http://images.myautoproduc.com/images/Product_Media/MSDS/SEM/SEM-39537_MSDS.pdf">http://images.myautoproduc.com/images/Product_Media/MSDS/SEM/SEM-39537_MSDS.pdf</a></td>
</tr>
<tr>
<td>CHROMASOLV</td>
<td>Used for HPLC</td>
<td>&gt;99.9%</td>
<td><a href="http://www.nfc.umn.edu/assets/pdf/msds/carbon_tetrachloride.pdf">http://www.nfc.umn.edu/assets/pdf/msds/carbon_tetrachloride.pdf</a></td>
</tr>
<tr>
<td>Carbon Tetrachloride</td>
<td>NA</td>
<td>100%</td>
<td><a href="https://www.nwmissouri.edu/naturalsciences/sds/carbon%20tetrachloride.pdf">https://www.nwmissouri.edu/naturalsciences/sds/carbon%20tetrachloride.pdf</a></td>
</tr>
<tr>
<td>Trade name</td>
<td>Use of the Product (If Known)</td>
<td>% by weight of chemical</td>
<td>Link to references, SDS or industry information</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td>-------------------------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>CHLORINATED BRAKE PARTS CLEANER</td>
<td>Brake cleaner</td>
<td>0.1-1%</td>
<td><a href="http://www.spraywayinc.com/sites/all/themes/the">http://www.spraywayinc.com/sites/all/themes/the</a> me687/msds/sw073.pdf</td>
</tr>
<tr>
<td>Tetrachloromethane</td>
<td>NA</td>
<td>100%</td>
<td><a href="http://www.synquestlabs.com/msds/1100-4-01.pdf">http://www.synquestlabs.com/msds/1100-4-01.pdf</a></td>
</tr>
<tr>
<td>Primer No 1</td>
<td>Sealant</td>
<td>&lt;1.5%</td>
<td><a href="http://www.tremcosealants.com/fileshare/msds/000002521481164_C.PDF">http://www.tremcosealants.com/fileshare/msds/000002521481164_C.PDF</a></td>
</tr>
<tr>
<td>Adhesive 100</td>
<td>Adhesive</td>
<td>0%</td>
<td><a href="http://www.sfm.state.or.us/CR2K_SubDB/MSDS/REI">http://www.sfm.state.or.us/CR2K_SubDB/MSDS/REI</a> LLY_ADHESIVE_100.PDF</td>
</tr>
</tbody>
</table>

No reports of articles containing carbon tetrachloride were found.
4. Distribution (Includes Retailers)

Distribution of carbon tetrachloride is limited, as the majority of the chemical is used as a feedstock to make other chemicals, and therefore is used almost entirely on site rather than being re-distributed into commerce.

The table below provides examples of products containing carbon tetrachloride that are available for purchase online.

<table>
<thead>
<tr>
<th>Product</th>
<th>Description and price</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welder Adhesive</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note: Is unclear whether the new or old formulas are for sale</td>
<td><a href="https://www.menards.com/main/home-decor/craft-supplies/glue/epoxy-glue/loctite-20-min-plastic-bonder-epoxy-0-85-oz/p-1444432303984.htm">https://www.menards.com/main/home-decor/craft-supplies/glue/epoxy-glue/loctite-20-min-plastic-bonder-epoxy-0-85-oz/p-1444432303984.htm</a></td>
</tr>
<tr>
<td>RAMUC PRO 2000 Chlorinated</td>
<td>Rubber Pool Paint (1 gallon for $84.95, $196.00)</td>
<td><a href="https://www.google.com/webhp?sourceid=chrome-instant&amp;ion=1&amp;espv=2&amp;ie=UTF-8&amp;q=RAMUC+PRO+2000+Chlorinated+Rubber+Pool+Paint">https://www.google.com/webhp?sourceid=chrome-instant&amp;ion=1&amp;espv=2&amp;ie=UTF-8&amp;q=RAMUC+PRO+2000+Chlorinated+Rubber+Pool+Paint</a></td>
</tr>
<tr>
<td>Rubber Pool Paint</td>
<td>Note: Only listed as an impurity</td>
<td><a href="https://www.walmart.com/ip/Pro-2000-Chlorinated-Rubber-Pool-Coating-Dawn-Blue-5-Gallon-Pail-per-Pail/160687567?wmlspartner=wpawpsellerlistid=1293&amp;adid=22222222227000000000&amp;wl0=&amp;wl1=g&amp;wl2=c&amp;wl3=42423897272&amp;wl4=pla-51320962143&amp;wl5=9061285&amp;wl6=&amp;wl7=&amp;wl8=&amp;wl9=pla&amp;wl10=113137480&amp;wl11=online&amp;wl12=160687567&amp;wl13=&amp;veh=sem">https://www.walmart.com/ip/Pro-2000-Chlorinated-Rubber-Pool-Coating-Dawn-Blue-5-Gallon-Pail-per-Pail/160687567?wmlspartner=wpawpsellerlistid=1293&amp;adid=22222222227000000000&amp;wl0=&amp;wl1=g&amp;wl2=c&amp;wl3=42423897272&amp;wl4=pla-51320962143&amp;wl5=9061285&amp;wl6=&amp;wl7=&amp;wl8=&amp;wl9=pla&amp;wl10=113137480&amp;wl11=online&amp;wl12=160687567&amp;wl13=&amp;veh=sem</a></td>
</tr>
<tr>
<td>MOTO-SEAL 1 ULTIMATE GASKET</td>
<td>Sealant (2.7 oz. tube for $4.61, $8.74)</td>
<td><a href="http://www.autopartsandstuff.com/permatex-ptx-29132-motosealultimategasketmakergrey27oztube.aspx?gclid=CObVka">http://www.autopartsandstuff.com/permatex-ptx-29132-motosealultimategasketmakergrey27oztube.aspx?gclid=CObVka</a> mbl9ECFY5WDQdUkJKMH4A</td>
</tr>
<tr>
<td>MAKER GREY 80 ML</td>
<td></td>
<td><a href="http://www.ebay.com/itm/like/172439663876?pid=82&amp;chn=ps&amp;ul_noapp=true">http://www.ebay.com/itm/like/172439663876?pid=82&amp;chn=ps&amp;ul_noapp=true</a></td>
</tr>
<tr>
<td>Carbon Tetrachloride</td>
<td>200 L Steel Drums of Industrial Grade Carbon Tetrachloride ($400-$500/ton)</td>
<td><a href="https://www.alibaba.com/productdetail/CCL4_60023332226.html?spm=a2700.7724838.0.0.h1buQj">https://www.alibaba.com/productdetail/CCL4_60023332226.html?spm=a2700.7724838.0.0.h1buQj</a></td>
</tr>
</tbody>
</table>
5. Use

Since production of carbon tetrachloride for most uses has been phased-out due to the Montreal Protocol and Clean Air Act, the chemical is only available for those uses for which no effective substitute has been found, such as chemical feedstock use, use as a processing agent, and laboratory or analytical use.

Uses of carbon tetrachloride includes non-incorporative activities in the following sectors, as reported to CDR:

- All other basic organic chemical manufacturing
- Pesticide, fertilizer, and other agricultural chemical manufacturing

Laboratory and analytical uses of carbon tetrachloride include:

- Equipment calibration
- Solvent - based extraction
- Chemical analyses as a carrier
- ODS (Ozone Depleting Substance) monitoring
- Detection of volatile organic compounds
- Assessment of iodine value of fats and oils & viscosity coefficient
- Tests for toxicity characteristics / leaching
- Analysis of oil mist
- Detection of heavy metals and pesticides
- Nuclear magnetic resonance
- Infrared spectroscopy


Use at Industrial Sites

Industrial Sectors and Function Categories that reported to CDR for carbon tetrachloride include:

- Basic organic chemical manufacturing
  - Intermediate
  - Process Regulator
- Pesticide, fertilizer, and other agricultural chemical manufacturing
- Laboratory Chemicals

Source: https://java.epa.gov/chemview
Facilities reporting to TRI in 2015 for carbon tetrachloride use include facilities in the following sectors.

**Table 3: Facilities Reporting to TRI for Use in Facilities**

<table>
<thead>
<tr>
<th>NAICS Code</th>
<th>NAICS Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>325180</td>
<td>Other Basic Inorganic Chemical Manufacturing</td>
</tr>
<tr>
<td>325199</td>
<td>All Other Basic Organic Chemical Manufacturing</td>
</tr>
<tr>
<td>325120</td>
<td>Industrial Gas Manufacturing</td>
</tr>
<tr>
<td>327310</td>
<td>Cement Manufacturing</td>
</tr>
<tr>
<td>327992</td>
<td>Ground or Treated Mineral and Earth Manufacturing</td>
</tr>
</tbody>
</table>

According to the HSDB TOXNET database, uses of carbon tetrachloride include:

- Recovery of tin-in-tin plating waste
- In formulation of petrol additives
- Solvent for rubber cement; cleaning agent for machinery and electrical equipment; in synthesis of nylon-7 and other organic chlorination processes.
- Use in polymer technology as reaction medium, catalyst; in organic synthesis for chlorination of organic compounds.
- Industrial solvent for cable and semiconductor manufacture.
- Metal recovery and catalyst regeneration.
- Chemical intermediate for tetrabromomethane and pyrosulfuryl chloride
- Solvent for asphalt, benzyl resin, bitumens, chlorinated rubber, ethylcellulose, gums, and rosin.

As described by the NESHAP for Certain Source Categories, industrial uses of carbon tetrachloride include as a diluent for nitrogen trichloride or as a scrubbing liquid to recover chlorine from the liquefaction of tail gas (59 FR 19402, April 22, 1994).

Carbon tetrachloride is used in reactive ion etching (RIE) which involves ion bombardment to achieve directional etching and a chemically reactive gas (such as carbon tetrachloride) to maintain etched layer selectivity. Another source claims to use carbon tetrachloride to dope gallium arsenide and indium-gallium arsenide films with carbon during metalorganic vapor-phase epitaxy (MOVPE) (OSHA).

Sources: [https://www.osha.gov/SLTC/semiconductors/metallization_metaletch.html](https://www.osha.gov/SLTC/semiconductors/metallization_metaletch.html)  

**Commercial Uses**

Commercial use of carbon tetrachloride in an academic or other laboratory setting includes as a solvent, reagent or reference material.

Based on products identified in Table 1, the following are potential commercial uses of carbon tetrachloride:

- Adhesives
- Brake Cleaner
- Dry cleaning and other textile cleaning
- Paints (pools, traffic, other coatings)
- Paint Remover
- Synthetic Rubber

**Consumer Uses**

Carbon tetrachloride and mixtures containing it (with the exception of chemicals containing unavoidable residues of carbon tetrachloride that do not result in atmospheric concentrations of carbon tetrachloride greater than 10 ppm) were banned in 1970 by the Consumer Product Safety Commission (CPSC), under the Federal Hazardous Substance Act (FHSA) 16 CFR 1500.17 Although banned in consumer products, a number of products containing carbon tetrachloride are available from online sources and could foreseeably be purchased and used by consumers (See Table 2 for examples).

**Past and Potential Uses**

*Discontinued Uses of Carbon Tetrachloride:*

- Parks Adhesive Remover-09/04/1998
- Trim/Detail Adhesive (Kit with Activator) - Auto products
- Radio Shack Plastic Bonder
- Spark-Fas Adhesive (non-flammable brush), Foster 85-20
- Fire Extinguishers
- Waterless shampoo
- Solvent
- Dry-cleaning agent
- Grain fumigant
- Manufacture of Freon refrigerants

Sources: [https://www.cdc.gov/niosh/pdfs/76-133b.pdf](https://www.cdc.gov/niosh/pdfs/76-133b.pdf)
[https://www.whatsinproducts.com/chemicals/view/1/309](https://www.whatsinproducts.com/chemicals/view/1/309)

*Current International Uses of Carbon Tetrachloride:*

- Article 5(1) Countries: the 2002 Montreal Report found that there are many users of small quantities of carbon tetrachloride for open-tank cold cleaning, involving thousands of Ozone Depleting (OD) tonnes of the substance. In 2000, the estimated global about of OD tonnes in Article 5(1) countries was 15,400.
In developing countries, carbon tetrachloride is still used in various cleaning processes, including fabric cleaning (UNEP 2003).

China was granted an essential use exemption for 65 tonnes of carbon tetrachloride for the testing of oil, grease and total petroleum hydrocarbons in water for 2017.


Additional use information on this chemical is available at: [https://echa.europa.eu/substance-information/substanceinfo/100.000.763](https://echa.europa.eu/substance-information/substanceinfo/100.000.763). It is copyrighted and cannot be reproduced here.

The table below is from the 2004 UNEP TEAP report of the Process Agent Task Force and presents the international uses of carbon tetrachloride.

**Table 4: List of International Process Agents**

<table>
<thead>
<tr>
<th>Country</th>
<th>Process Name</th>
<th>Application</th>
<th>Date Presented</th>
<th>Chemical Used As</th>
<th>Consumption (tonnes)</th>
<th>Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPR Korea</td>
<td>Ascorbic Acid</td>
<td>Vitamin</td>
<td>12.19.03</td>
<td>Carbon Tetrachloride</td>
<td>75.3</td>
<td>L-sorbose fermentation</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>Ciproflaxin</td>
<td>Antibiotic</td>
<td>12.19.03</td>
<td>Carbon Tetrachloride</td>
<td>16.3</td>
<td>Solventless chlorination</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>Norfloxicin</td>
<td>Antibiotic</td>
<td>12.19.03</td>
<td>Carbon Tetrachloride</td>
<td>60</td>
<td>Solventless chlorination</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>Sodium dichloro-icocyanurate</td>
<td>Disinfectant</td>
<td>12.19.03</td>
<td>Carbon Tetrachloride</td>
<td>59.6</td>
<td>Reaction Control</td>
</tr>
<tr>
<td>Romania</td>
<td>2,4-D</td>
<td>Herbicide</td>
<td>01.14.04</td>
<td>Carbon Tetrachloride</td>
<td>99.7</td>
<td>Perchloroethylene</td>
</tr>
<tr>
<td>Romania</td>
<td>DEHPC</td>
<td>Initiator</td>
<td>01.14.04</td>
<td>Carbon Tetrachloride</td>
<td>73.3</td>
<td>PVA Dispersion</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Cyanocobalamin$^{57}$Co</td>
<td>Essay for Vitamin B12</td>
<td>02.13.04</td>
<td>Carbon Tetrachloride</td>
<td>0.008</td>
<td>Needs Approval</td>
</tr>
</tbody>
</table>

6. Disposal of Waste and Recycling/Recovery

According to information reported to TRI for 2015, of the 47 facilities who reported to TRI for carbon tetrachloride, 5 reported on-site releases and 4 reported off-site recycling. Of the 47, 44 reported some sort of release or other waste management. Overall, 12,671 lbs. of carbon tetrachloride were transferred offsite to landfills and/or other treatment/disposal facilities and 139,943 pounds were released to air, water, and land. Additionally, 5,951,403 pounds of carbon tetrachloride was recycled on-site, and 2,663 pounds was recycled off-site in 2015.

According to the 2016 CDR data, companies have reported recycling carbon tetrachloride. The number of companies is confidential business information (CBI).

Source: https://www.atsdr.cdc.gov/toxprofiles/tp30-c5.pdf
https://java.epa.gov/chemview

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:1:0::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/rthksfs/rthksl.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