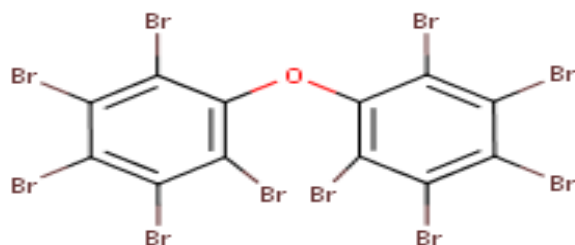


Preliminary Information on Manufacturing, Processing, Distribution, Use, and Disposal:

Decabromodiphenyl Ether

CASRN: 1163-19-5



August 2017

Support document
for Docket EPA-HQ-OPPT-2016-0724

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 (if available), 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 December 9, 2017, will inform efforts to identify, under section 6(h)(1)(B) of the Toxic Substances Control Act (TSCA), whether exposure to this chemical is likely, under the conditions of use, either to the environment, the general population, or to a potentially exposed or susceptible subpopulation identified by EPA. The information will also inform any risk management efforts following the exposure and use assessment under TSCA section 6(h)(1)(B).

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).

TABLE OF CONTENTS

CONTACT	3
MANUFACTURING, PROCESSING, DISTRIBUTION, USE, AND DISPOSAL.....	4
1. MANUFACTURING (INCLUDING IMPORTING).....	4
2. PROCESSING.....	5
3. USE - PRODUCTS AND ARTICLES	6
4. DISTRIBUTION (INCLUDES RETAILERS).....	9
5. DISPOSAL OF WASTE AND RECYCLING/RECOVERY	9
USEFUL TYPES OF INFORMATION	10
APPENDIX: SOURCES CONSULTED	11

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Docket: EPA-HQ-OPPT-2016-0724

MANUFACTURING, PROCESSING, DISTRIBUTION, USE, AND DISPOSAL

1. Manufacturing (Including Importing)

Decabromodiphenyl ether (deca BDE) is a member of a class of brominated flame retardants that are added to plastics, textiles, and other materials to retard combustibility. When fire occurs, these polybrominated diphenyl ethers (PBDEs) utilize vapor-phase chemical reactions that interfere with the combustion process, thus delaying ignition and inhibiting the spread of fire. These characteristics have promoted the widespread use of PBDEs in textiles, flexible polyurethane foams used in upholstery stuffing for furniture and car seats, electronic components, electrical components, and plastics used in the casings of televisions, personal computers, and other electronic equipment. [EPA: *An Exposure Assessment of Polybrominated Diphenyl Ethers* (2010)]

For the 2012 Chemical Data Reporting (CDR) period, data indicates that 5 sites manufactured (including imported) deca BDE in the United States^{1,2}. The total volume (in lbs) of deca BDE manufactured (including imported) in the United States in 2010 was 51,008,002; in 2011: 18,110,827. However, the principle domestic manufacturers and importers of commercially available deca BDE agreed to voluntarily phase out domestic manufacture and import of the chemical no later than December 31, 2013. EPA believed that other domestic manufacturers and importers of deca BDE would also cease their activities by that date.

Preliminary data for the 2016 CDR period indicates that 4 sites reported domestic manufacture or import of deca BDE. The total volume of deca BDE manufactured (including imported) in the United States was 16,696,951 lbs in 2012, between 1,000,000 and 10,000,000 lbs in 2013, between 100,000 and 500,000 lbs in 2014, and less than 25,000 lbs in 2015. Actual production volume for years 2013 through 2015 is claimed as confidential business information.

Data from the 2015 Toxics Release Inventory (TRI) shows a total of 211,498 lbs of total on- and off-site reported releases of deca BDE from 29 sites. Of these, 1 site reported production, 2 reported import, and 23 reported processing of deca BDE.

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>

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

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>

Manufacturing Process

Commercial production of PBDEs began in 1976. Each commercial formulation is manufactured through the chemical reaction of bromine with diphenyl oxide (also known as diphenyl ether) in the presence of an inorganic catalyst (e.g., AlCl_3). The amount of bromine and the time allotted for the chemical reaction control the extent of bromination on the diphenyl ether molecule. The stepwise addition of bromine causes the formation of lower- to higher-brominated congeners until the total desired amount of bromination is obtained. The molecular backbone consists of two phenyl rings interconnected by an oxygen atom. There are 10 positions whereby a bromine atom can substitute a hydrogen atom on the molecule with the possibility of 10 homologue groups identified by the preface mono-, di-, tri-, tetra-, penta-, hexa-, hepta-, octa-, nona-, and deca DBE. Commercial formulations of deca BDE have a bromine content of about 83%. [EPA 2010]

2. Processing

For the 2015 TRI reporting year, the following types of facilities reported processing³ deca BDE.

As a formulation component:

- All Other Rubber Product Manufacturing (NAICS 326299)
- Copper Rolling, Drawing, Extruding, And Alloying (NAICS 331420)
- Other Communication and Energy Wire Manufacturing (NAICS 335929)
- Custom Compounding of Purchased Resins (NAICS 325991)
- All Other Plastics Product Manufacturing (NAICS 326199)
- Nonwoven Fabric Mills (NAICS 313230)
- Fabric Coating Mills (NAICS 313320)
- Plastics Material and Resin Manufacturing (NAICS 325211)
- Adhesive Manufacturing (NAICS 325520)
- Urethane and Other Foam Product (except Polystyrene) Manufacturing (NAICS 326150)

As an article component:

- Other Communication and Energy Wire Manufacturing (NAICS 335929)
- All Other Rubber Product Manufacturing (NAICS 326299)
- All Other Plastics Product Manufacturing (NAICS 326199)
- Fabric Coating Mills (NAICS 313320)
- Copper Rolling, Drawing, Extruding, And Alloying (NAICS 331420)

³ The term "process" 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>

3. Use - Products and Articles

Deca BDE is an additive flame retardant. Additive flame retardants are incorporated into polymers via physical mixing, and are not chemically bound to the polymer. As a result, the polymer/additive mixture is less susceptible to combustion than the polymer alone. Since additive flame retardants can be incorporated up until the final stages of production, it is usually easier to use additive flame retardants than reactive flame retardants. [EPA: *An Alternatives Assessment for the Flame Retardant Decabromodiphenyl Ether (DecaBDE)* (2014), available at https://www.epa.gov/sites/production/files/2014-05/documents/decabde_final.pdf]

The primary use of deca BDE is in high impact polystyrene-based products, and in the manufacture of rubber and plastics. The three major product categories in which deca BDE has been used as a flame retardant are: textiles, electronic equipment, and building and construction materials. Articles treated with deca BDE are used in the home, in business settings, and in the transportation sector. Articles often treated with deca BDE include carpets, upholstery fabric, back coatings, cushions, mattresses, and tents. Deca BDE is also found in plastics used as components in electrical appliances and equipment such as stereos, computers, televisions, circuit boards, casings, and cable insulation. Other specified uses in the transportation and construction sector are in the fabrics of automobiles, aircrafts, and in wood used as building materials. [WHO: *Brominated diphenyl ethers* (1994), available at: <http://www.inchem.org/documents/ehc/ehc/ehc162.htm#SubSectionNumber:1.1.2>]

In addition to the facilities that reported processing deca BDE, for the 2015 TRI reporting year, facilities in the following NAICS codes reported using deca BDE as a chemical processing aid, a manufacturing aid, or as an ancillary or other use:

- 326130 - Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing
- 562211 - Hazardous Waste Treatment and Disposal (Primary)

Under its Children's Safe Product Act, the State of Washington has received reports of children's products that contain deca BDE, including bibs, bracelets and necklaces, sportswear, undergarments, socks and shoes, craft materials, blankets, and dolls and other toys. [State of Washington Department of Ecology, *Children's Safe Product Act Reported Data*, last accessed March 29, 2017. Available at <https://fortress.wa.gov/ecy/cspareporting/>]

EPA identified the following types of products [and articles] based on a search of available sources for products containing deca BDE. This list is provided for informational purposes only. EPA and its employees do not endorse any of the products or companies.

Table 1: Products and Articles

Trade name	Use of the product/article as described in the SDS or the company website	% by weight of chemical	Link to references, SDS or industry information
Laboratory / Research Use			
Decabromodiphenyl ether (BDE 209) Solution	For laboratory use only	0.01	http://cdn.chemservice.com/product/msdsnew/External/English/S-15886J0%20English%20SDS%20US.pdf 06/15/2016
Decabromodiphenyl ether	For research use only	>98	http://datasheets.scbt.com/sds/aghs/en/sc-239649.pdf Revision Date: 04/21/2016
Decabromodiphenyl Ether	For laboratory research purposes.	>95.0%(GC	https://www.spectrumchemical.com/MSDS/TCL-D1388.pdf Revision date: 10/17/2016
Decabromodiphenyl ether (BDE 209)	For laboratory use only	100	http://cdn.chemservice.com/product/msdsnew/External/English/N-15886%20English%20SDS%20US.pdf Issue date: 05/02/2016
Bis(pentabromophenyl) ether	Scientific research and development	Not specified	https://www.alfa.com/en/content/msds/english/L04656.pdf Printing date: 10/29/2015 Revision date: 02/06/2014
Decabromodiphenyl ether	For research use only. Not intended for diagnostic or therapeutic use	Not specified	http://datasheets.scbt.com/sds/wpna/en/sc-239649.pdf
Bis(pentabromophenyl) ether	Scientific research and development	Not Specified	https://www.alfa.com/en/content/msds/british/L04656.pdf Printing Date: 10.26.2015 Revision Date: 0.2.2014
Decabromodiphenyl ether	Reference material	0.1%	http://www.spexcertiprep.com/MSDS/S-5656.pdf Printing date: 10/11/2016
Pentabromophenyl ether	Unspecified	0.1%	http://www.spexcertiprep.com/MSDS/S-2926.pdf Printing/revision date: 03/13/2014
Decabromodiphenyl ether	Not specified	Not specified	https://www.lakeland.edu/PDFs/MSDS/1013/Decabromodiphenyl%20Ether%20(Sigma).pdf Revision date: 01/19/2012 Print date: 01/23/2012
Pentabromophenyl ether, 98%	Not specified	98	http://www.chemblink.com/MSDS/MSDSFiles/1163-19-5_Fisher%20Scientific.pdf MSDS Creation Date: 2/10/2000 Revision #5 Date: 3/25/2008
Building Products			
Sarnavap Self Adhered	Roofing membrane	1-5	http://www.buildsite.com/pdf/sarnafil/Sarnavap-Self-Adhered-SDS-289631.pdf Print date: 05/04/2007 Revision date: 05/02/2007
GAF MasterFlow™ Flexible Ductwork	Ductwork	10-15	http://www.homedepot.com/catalog/pdfimages/25/25be5930-c420-4f51-a040-82b4c2d44d49.pdf January 2011
IXPE FOAM- Physically crosslinked polyethylene foam mattresses, sheets and pipes	Not specified	Not specified	http://www.durfoam.com/pdf/durprox/datasheet/MSDS.002_-_IXPE_Foam_Malzeme_Guvenlik_Bilgi_Formu_ENG.pdf Release date: 21/09/2010

Trade name	Use of the product/article as described in the SDS or the company website	% by weight of chemical	Link to references, SDS or industry information
JM 0.060 White EPDM Roofing Membrane	Not specified	4-10	http://www.buildsite.com/pdf/johnsmanville/JM-Reinforced-EPDM-Roofing-Membranes-045R-XT-060R-XT-075R-XT-MSDS-B18648.pdf Issue date: 06/16/2010
Micro-Lok® Pipe Insulation	Not specified	<1	http://kcfsv.com/wp-content/uploads/2015/02/Micro-Lok-Pipe-Insulation.pdf Issue Date: 09/08/2011
SolarGuard Reflective Insulation	Not specified	Not specified	http://www.energyconscious.com/media/pdf/solarguard-wi002-msds.pdf June 2007
Fiber Glass Wool Insulation	Not specified	<1	http://www.orcbs.msu.edu/msds/080311_ED_18_Fiber%20Glass%20Wool%20Insulation.pdf Issue date: 01/05/2006
RTP PP 30 GF FRO BLK	Polypropylene glass fiber product	20-50	https://www.rtpcompany.com/wp-content/uploads/2013/09/RTPPP30GFFROBLK.pdf Revised/Printed 03/01/2006
Superseal® Edge Treatment; Superseal® HV	Coating product	1-10	http://www.buildsite.com/pdf/johnsmanville/SuperSeal-Coating-Products-SDS-B18631.pdf Issue Date: 02/26/2010
ERS-Ecothane Basecoat	Polyurethane roof coating	2.1	http://www.buildsite.com/pdf/ecologyroofsystems/ERS-Ecothane-Basecoat-Topcoat-SDS-B31611.pdf Date not specified
DELTA® PC (Precision Cut), PF (Pre-Formed), and FPF (Field Pre-Formed) Mineral Wool Pipe Insulation	Pipe insulation		http://www.deltainsulation.com/assets/files/MSDS_Pipe_10.pdf
GL Facings	Facing for fiberglass batt insulation, duct wrap or duct board products.	7-11	http://www.jm.com/content/dam/jm/global/en/Facings/Facings-sds/GLVR%20SDS_EN.pdf Issue Date: 10/05/2009
Plexco® Flame Retardant Polyethylene Tubing	Pneumatic tubing or fiber pathway	Not specified	http://www.performancepipe.com/en-us/Documents/Plexco%202600%20FRPE%20MSDS.pdf Date not specified
PE80005 - PERMAX 800 URETHANE TOPCOAT - WHITE	Roof coating	1 - 5	http://www.buildsite.com/pdf/henry/PERMAX-800-SDS-B14978.pdf Issue date: 06/28/2010
Certain Teed Corporation	Foil-surfaced SBS modified bitumen membrane used for flashing and weatherproofing	No specified	http://www.buildsite.com/pdf/certaineed/FlintClad-SDS-588324.pdf Preparation/Last Revision Date: 10/04/2011
GL-10; GL-30; GL-PD; GL-VR	Facing for fiberglass batt insulation, duct wrap or duct board products.	7-11	https://www.jm.com/content/dam/jm/global/en/Facings/Facings-sds/GLVR%20SDS_EN.pdf Issue Date: 10/05/2009
Miscellaneous/Not specified			
CHEMTHANE 7001F B FR	Polyurethane polyol blend with additives	1-20	http://www.polysource.ca/chemical_systems/chemline-msds/CHEMTHANE%207001FR%20B%209-05-12.pdf Date printed: 08/27/2010

Trade name	Use of the product/article as described in the SDS or the company website	% by weight of chemical	Link to references, SDS or industry information
V0044G Natural	Industrial applications. Plastics	25 - 50	http://www.polyone.com/files/msds/EM10029289-NORTH_AMER-E.pdf Revision date: 06/02/2016 Print date: 06/03/2016
XCPE 30-2 D5 BLACK	Industrial applications. Plastics.	5 – 10 %	http://www.polyone.com/files/msds/EM10021443-NORTH_AMER-E.pdf Revision date: 03/10/2015 Print date: 03/12/2015
MAGNUM* 2645 ABS FACTORY COLOR	Unspecified	0-14%	http://catalog.ides.com/WebFileShare/ClientDocs/CPA/DowABS2545MSDS.pdf Effective date: 02/02/99 Date printed: 07/17/00
Araldite 252 Resin	Epoxy resin paste	10-30	http://objects.eanixter.com/PD367220.PDF Printed: 05/11/2010
RMB 435	High impact flame retardant polyamide based resin, specifically formulated for aerospace ECS ducting	<5	http://www.rmbproducts.com/img/site_specific/uploads/RMB_435_MSDS.pdf MSDS Date: 09/12/2012
SCOTCHCAST BRAND FLAME RETARDANT COMPOUND 2130	Electrical Insulating resin	5 - 10	http://www.paisleyproducts.com/content/files/content/msds/AV3MZ00002UK_msds_9_9_2014.pdf 10/09/2007

4. Distribution (Includes Retailers)

For the 2015 TRI reporting year, 1 facility reported producing deca BDE for onsite use or processing and 2 facilities reported importing deca BDE for onsite use or processing.

Deca BDE is available for import from foreign suppliers.

5. Disposal of Waste and Recycling/Recovery

For 2015, one facility in the Hazardous Waste Treatment and Disposal (NAICS 562211) sector reported to TRI for deca BDE. In the 2015 TRI reporting year, a total of 70,542 lbs of deca BDE were transferred offsite to landfills and/or other treatment/disposal facilities and 140,956 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. EPA is interested in obtaining information to more fully characterize the manufacturing, processing, distribution, disposal, and use of this chemical, to inform the development of the exposure and use assessment for this chemical, and to inform any subsequent risk management efforts. For example, 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*
<https://www.epa.gov/superfund/superfund-chemical-data-matrix-scdm-query>
- 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*
<https://chem.sis.nlm.nih.gov/chemidplus/>
- U.S. National Library of Medicine *Hazardous Substance Data Bank (HSBD)*
<https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- U.S. Department of Health & Human Services *Household Products Database*
<https://hpd.nlm.nih.gov/index.htm>
- OSHA *Chemical Hazards and Toxic Substances*
<https://www.osha.gov/SLTC/hazardoustoxicsubstances/index.html>
- 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*
<http://www.cpsc.gov/en/Research--Statistics/Chemicals/>
- CPSC *FHSA*
<https://www.cpsc.gov/Business--Manufacturing/Business-Education/Business-Guidance/FHSA-Requirements/>
- 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*
<http://energy.gov/ehss/protective-action-criteria-pac-aegls-erpgs-teels-rev-29-chemicals-concern-may-2016>
- 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>
<http://www.dtsc.ca.gov/SCP/WhatIsAPriorityProduct.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)*
<http://www.mass.gov/eea/waste-mgmt-recycling/toxics/toxic-use-reduction/toxics-use-reduction-act/>
- Massachusetts *Complete list of TURA chemicals*
<http://www.mass.gov/eea/agencies/massdep/toxics/tur/toxics-use-reduction-act-tura-reporting-and-fees.html>
- 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*
<http://des.nh.gov/organization/commissioner/legal/rules/documents/env-a1400.pdf>
- New Jersey *Right to Know Hazardous Substances*
<http://web.doh.state.nj.us/rtkhsfs/rtkhsf.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*
<http://public.health.oregon.gov/HealthyEnvironments/HealthyNeighborhoods/ToxicSubstances/Pages/childrens-chemicals-of-concern.aspx>
- 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*
<http://www.ecy.wa.gov/programs/hwtr/rtt/cspa/chcc.html>
- 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
<http://www.ncsl.org/research/environment-and-natural-resources/state-chemical-statutes.aspx>
- Canada *Chemicals Portal*
<http://chemicalsubstanceschimiques.gc.ca/index-eng.php>
- EU *ECHA website*
<https://echa.europa.eu/>
- Australia *NICNAS Chemical Information*
<https://www.nicnas.gov.au/chemical-information>
- Japan *Chemical Risk Information Platform (CHIRP)*
http://www.nite.go.jp/en/chem/chrip/chrip_search/systemTop
- 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>
<http://chm.pops.int/TheConvention/ThePOPs/ChemicalsProposedforListing/tabid/2510/Default.aspx>
- WHO IPCS (UN)
<http://www.who.int/ipcs/en/>
- Other – worker protection information
<http://www.dguv.de/ifa/gestis/gestis-internationale-grenzwerte-fuer-chemische-substanzen-limit-values-for-chemical-agents/index-2.jsp>
- 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