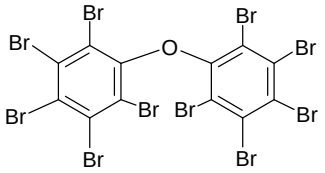
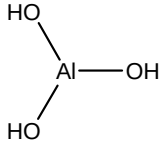
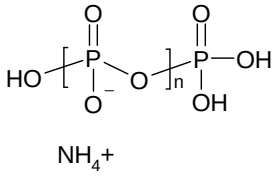
Decabromodiphenyl ether Alternatives Assessment

CAS RN	Chemical Name	Common Names and Synonyms	Molecular Formula	Structure
1163-19-5	Benzene, 1,1'-oxybis [2,3,4,5,6-pentabromo-	**DecaBDE*; Decabromodiphenyl ether***	$C_{12}Br_{10}O$	

List of Known or Expected Functional DecaBDE Alternatives Evaluated in the DfE Alternatives Assessment[a] July 2012

CAS RN	Chemical Name	Common Names and Synonyms	Molecular Formula	Structure
21645-51-2	Aluminum hydroxide	**Aluminum hydroxide***	$Al(OH)_3$	
68333-79-9	Polyphosphoric acids, ammonium salts	**Ammonium polyphosphate***; APP	$[NH_4\ PO_3]_n$	

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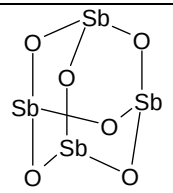
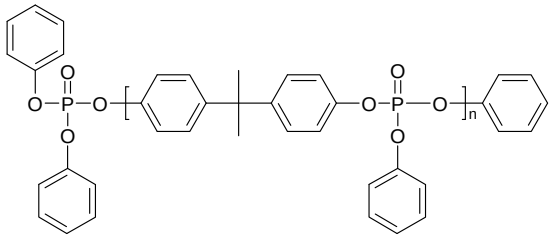
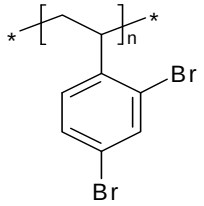
*Chemical name used in the report.

List of Known or Expected Functional DecaBDE Alternatives Evaluated in the DfE Alternatives Assessment.[a]
July 2012

CAS RN	Chemical Name	Common Names and Synonyms	Molecular Formula	Structure
1309-64-4	Antimony oxide	**Antimony trioxide***; Antimony oxide	Sb_2O_3	
181028-79-5; 5945-33-5	Phosphoric trichloride, reaction products with bisphenol A and phenol Phosphoric acid, P,P'-[(1-methylethylidene)di-4,1-phenylene] P,P,P',P'-tetraphenyl ester	**BAPP***; Bisphenol A bis-(diphenyl phosphate) (reaction products); BDP; BPADP	$C_{39}H_{36}O_8P_2$	
88497-56-7	Benzene, ethenyl-, homopolymer, brominated	**Brominated polystyrene***	$(C_8H_5Br_m)_n$	 (Representative Structure)

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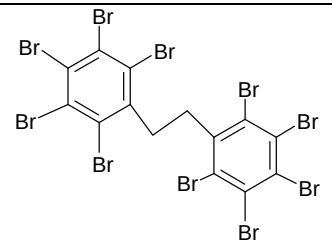
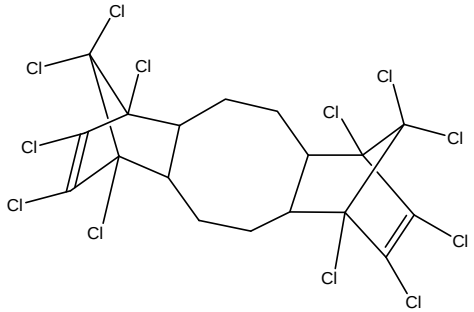
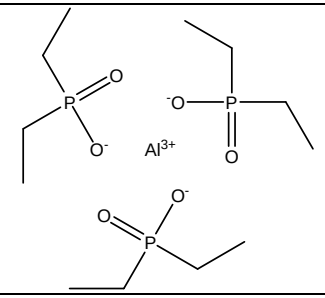
July 2012

CAS RN	Chemical Name	Common Names and Synonyms	Molecular Formula	Structure
84852-53-9	Benzene, 1,1'-(1,2-ethanediyl)bis[2,3,4,5,6-pentabromo-]	**Decabromodiphenyl ethane***; Ethane 1, 2 – (bispentabromophenyl); EBP; DBDPE	$C_{14}H_4Br_{10}$	
13560-89-9	1,4:7,10-Dimethanodibenzo[a,e]cyclooctene, 1,2,3,4,7,8,9,10,13,13,14,14-dodecachloro-1,4,4a,5,6,6a,7,10,10a,11,12,12a-dodecahydro-	**Bis(hexachlorocyclopentadieno) cyclooctane***; Dechlorane Plus	$C_{18}H_{12}Cl_{12}$	
225789-38-8[b]	Phosphinic acid, P,P-diethyl-, aluminum salt (3:1)	**Aluminum diethylphosphinate***; Diethylphosphinic acid, Aluminum salt	$3\ C_4H_{11}PO_2 \cdot Al$	

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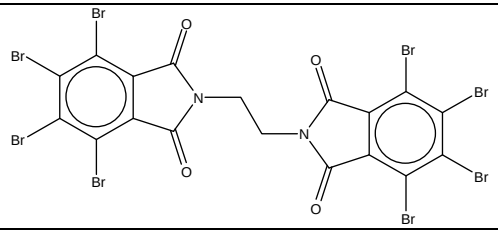
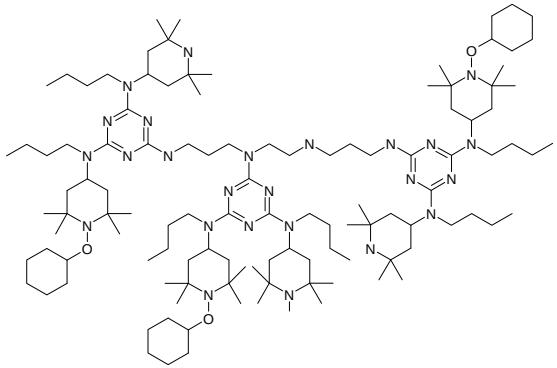
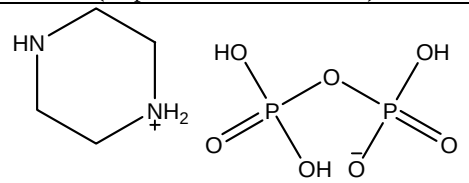
List of Known or Expected Functional DecaBDE Alternatives Evaluated in the DfE Alternatives Assessment.[a]
July 2012

CAS RN	Chemical Name	Common Names and Synonyms	Molecular Formula	Structure
32588-76-4	1H-Isoindole-1,3 (2H)-dione, 2,2'-(1,2-ethanediyl)bis[4,5,6,7-tetrabromo-	**Ethylene bis-tetrabromophthalimide***; EBTBP	$C_{18}H_4N_2O_4Br_8$	
191680-81-6	1,3-Propanediamine, N,N'-1,2-ethanediylbis-, reaction products with cyclohexane and peroxidized N-butyl-2,2,6,6-tetramethyl-4-piperidinamine-2,4,6-trichloro-1,3,5-triazine reaction products	**N-alkoxy hindered amine reaction products***; Flamestab Nor 116		 (Representative Structure)
66034-17-1	Diphosphoric acid, compd. with piperazine (1:1)	**Substituted amine phosphate mixture***; ADK STABILIZER 2000 series	$C_4H_{12}N_2.P_2O_7H_4$	
Proprietary	Substituted amine phosphate		--	--

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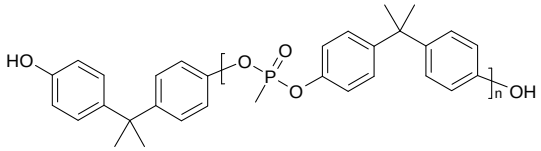
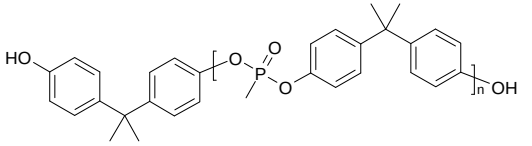
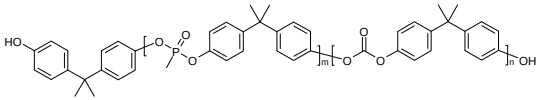
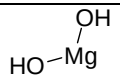
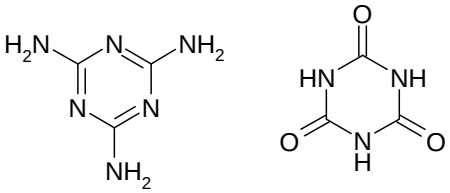
List of Known or Expected Functional DecaBDE Alternatives Evaluated in the DfE Alternatives Assessment.[a]
July 2012

CAS RN	Chemical Name	Common Names and Synonyms	Molecular Formula	Structure
68664-06-2[b]	Phosphonic acid, methyl-, diphenyl ester, polymer with 4,4-(1-methylethylidene)bis(phenol)-	**Polyphosphonate***; FRX 100		
68664-06-2[b]	Phosphonic acid, P-methyl-, diphenyl ester polymer with 4,4' - (1-methylethylidene) bis [phenol]	**Phosphonate oligomer***; FRX Oligomers		
77226-90-5	Carbonic acid, diphenyl ester, polymer with diphenyl P-methylphosphonate and 4,4'- (1-methylethylidene) bis [phenol]	**Poly[phosphonate-co-carbonate]***; FRX CO35, CO60		
1309-42-8	Magnesium hydroxide (Mg(OH)2)	**Magnesium hydroxide***	$Mg(OH)_2$	
37640-57-6	1,3,5-Triazine-2,4,6(1H,3H,5H)-trione, compd. with 1,3,5-triazine-2,4,6-triamine (1:1)	**Melamine cyanurate***	$C_3H_6N_6 \cdot C_3H_3N_3O_3$	

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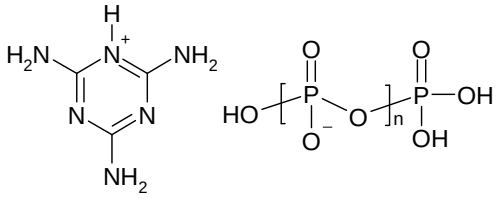
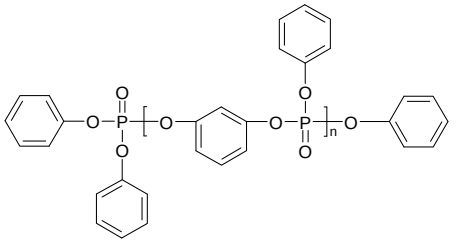
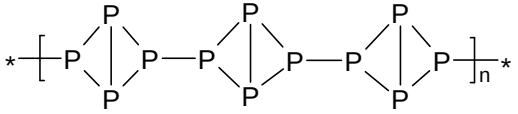
List of Known or Expected Functional DecaBDE Alternatives Evaluated in the DfE Alternatives Assessment.[a]
July 2012

CAS RN	Chemical Name	Common Names and Synonyms	Molecular Formula	Structure
15541-60-3; 218768-84-4	Diphosphoric acid, compd. with 1,3,5-triazine-2,4,6-triamine	**Melamine polyphosphate*** 218768-84-4 is a CASRN associated with the tradename Melapur 200.	$C_3H_6N_6 \cdot (H_3PO_4)_n$	
Proprietary	Proprietary	**Confidential brominated polymer***; Emerald 1000	--	--
Proprietary	Proprietary	**Confidential brominated epoxy polymer #1*; Confidential brominated epoxy polymer #2*; Confidential epoxy polymer mixture #1*; Confidential epoxy polymer mixture #2***; Polyquel	--	--
125997-21-9; 57583-54-7	Phosphoric trichloride, polymer with 1,3-benzenediol, phenyl ester, Phosphoric acid, P,P'-1,3-phenylene P,P,P',P'-tetraphenyl ester	**Resorcinol bis-diphenylphosphate***; RDP		
7723-14-0	Phosphorus	**Red Phosphorus***	P	

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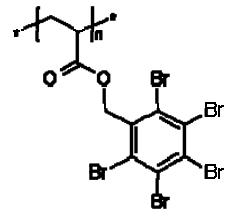
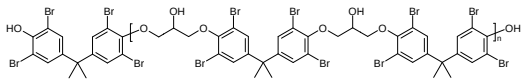
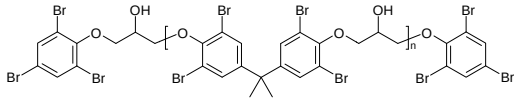
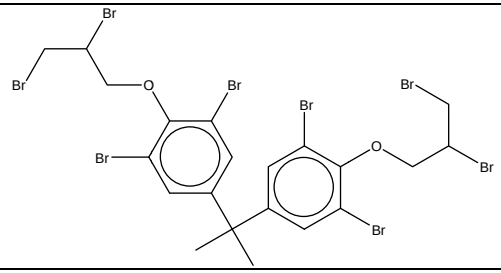
List of Known or Expected Functional DecaBDE Alternatives Evaluated in the DfE Alternatives Assessment.[a]
July 2012

CAS RN	Chemical Name	Common Names and Synonyms	Molecular Formula	Structure
59447-57-3	2-Propenoic acid, (2,3,4,5,6-pentabromophenyl)methyl ester, homopolymer	**Brominated polyacrylate***	$(C_{10}H_5Br_5O_2)_n$	
68928-70-1	Phenol, 4,4'-(1-methylethylidene)bis[2,6-dibromo-, polymer with 2,2'-[(1-methylethylidene)bis[(2,6-dibromo-4,1-phenylene)oxymethylene]]bis[oxirane]	**TBBPA glycidyl ether, TBBPA polymer***; TBBPA derivatives: Brominated epoxy oligomers/polymers		
135229-48-0[b]	Brominated epoxy resin end-capped with tribromophenol	**Brominated epoxy resin end-capped with tribromophenol***; TBBPA derivatives: End-capped brominated epoxy oligomers/polymers		
21850-44-2	Benzene, 1,1'-(1-methylethylidene)bis[3,5-dibromo-4-(2,3-dibromopropoxy)-	**Tetrabromobisphenol A bis (2,3-dibromopropyl) ether***	$C_{21}H_{20}Br_8O_2$	

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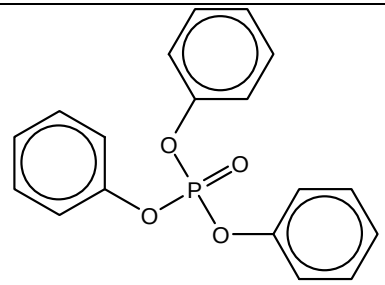
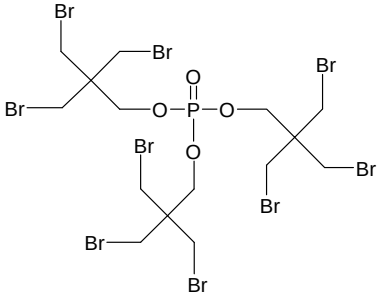
July 2012

CAS RN	Chemical Name	Common Names and Synonyms	Molecular Formula	Structure
115-86-6	Phosphoric acid, triphenyl ester	**Triphenyl phosphate***; TPP	$C_{18}H_{15}O_4P$	
19186-97-1	1-Propanol, 3-bromo-2,2-bis(bromomethyl)-, 1,1',1''-phosphate	**Tris(tribromoneopentyl) phosphate***	$C_{15}H_{24}Br_9O_4P$	

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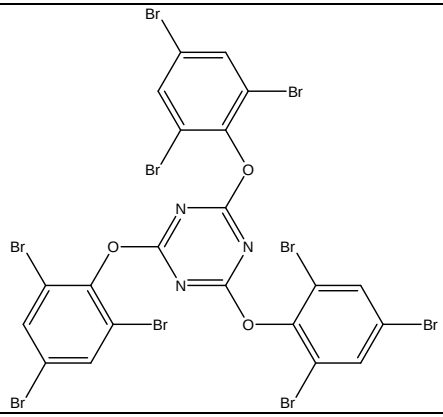
List of Known or Expected Functional DecaBDE Alternatives Evaluated in the DfE Alternatives Assessment.[a]
July 2012

CAS RN	Chemical Name	Common Names and Synonyms	Molecular Formula	Structure
25713-60-4	1,3,5-Triazine, 2,4,6-tris(2,4,6-tribromophenoxy)-	**Tris(tribromophenoxy) triazine***; Tris(tribromophenyl) cyanurate	$C_{21}H_6Br_9N_3O_3$	
138265-88-0[b]; 1332-07-6	Boron zinc hydroxide oxide, Boric acid, zinc salt	**Zinc borate***	$B_{12}Zn_4(OH)_{14}O_{15}$ $xZnO \cdot yB_2O_3 \cdot zH_2O$	$xZnO \cdot yB_2O_3 \cdot zH_2O$

[a] The inclusion of these chemicals in the DfE Alternatives Assessment does not denote environmental preferability.
[b] Chemicals shown here with the superscript "b" are not listed on the non-confidential version of the Toxic Substances Control Act (TSCA) Inventory. Chemicals that are manufactured (including imported) for commercial purposes within the USA, and that are subject to TSCA, must be listed on the TSCA Inventory. There are two versions of the Inventory, one containing specific chemical identities not claimed as confidential by the initial lister (i.e., Premanufacture Notice, or PMN, submitter) and another that contains only generic chemical identities to protect information claimed as confidential. If a chemical is not listed in either version of the Inventory and does not fall under any application exemption (e.g., polymer, low volume, etc) it may not be imported or sold in the USA without prior submission of a PMN to the Environmental Protection Agency. Further information can be found here: http://www.epa.gov/opptintr/existingchemicals/pubs/tscainventory/basic.html.
*Chemical name used in the report.