Restricted Chemicals for Prolonged Skin Contact Materials

An important goal at Apple is to make sure that anyone who assembles, uses, or recycles an Apple product can do so safely. We've led the industry in removing many harmful substances from our product designs, and we go to great lengths to continue doing so with every new product. We're constantly designing our products to be better for the environment, better for the people who use them, and better for the people who make them.

We pay special attention to the materials that will be in prolonged skin contact and apply rigorous controls for them. We require our suppliers of those materials to adhere to specifications that restrict the use of certain chemicals. We derive these restrictions from leading standards, recommendations from toxicologists and dermatologists, international laws and directives, and Apple policies. This document lists chemicals Apple restricts in materials in prolonged skin contact in wearable and non-wearable products.

As part of our testing and evaluation process, both Apple and independent laboratories test materials for the concentration of restricted chemicals. To evaluate safety, toxicologists review the test results and the chemical formulation of each material that may come in prolonged contact with the skin.

Only materials that pass these reviews are acceptable for use in Apple products. By setting conservative restrictions, testing for chemicals of concern, and conducting toxicology evaluations, Apple helps to ensure the safety of our customers.

Restricted Chemicals

The following table lists chemicals that are subject to Apple restrictions and testing. The restrictions apply to materials used in wearable and non-wearable devices that will be in prolonged skin contact, including natural and synthetic fibers and polymers, coatings, ink, leather, plastics, adhesives, metals, and ceramics.

Acrylamides	CAS Number
Acrylamide	79-06-1
N,N-dimethylacrylamide	2680-03-7
Acrylates	**CAS Number**
1,6-Hexanediol diacrylate	13048-33-4
2-Acryloyloxyethyl butylcarbamate	63225-53-6
2-(2-Ethoxyethoxy)ethyl acrylate	7328-17-8
2-Ethylhexyl acrylate	103-11-7
2-Hydroxyethyl acrylate	818-61-1
2-Phenoxyethyl acrylate (PHEA)	48145-04-6
3,3,5-Trimethylcyclohexyl acrylate (TMCHA)	86178-38-3
4-Acryloylmorpholine (ACMO)	5117-12-4
4-Tert-Butylcyclohexyl acrylate (TBCHA)	84100-23-2
Acrylic acid	79-10-7
Benzyl acrylate	2495-34-5
Butanediol diacrylate	1070-70-8
Butyl acrylate	141-32-2
Cyclic trimethylol-propane formal acrylate	66492-51-1
Ethyl acrylate	140-88-5
Isobornyl acrylate	5888-33-5
Isobutyl acrylate	106-63-8
Isodecyl acrylate	1330-61-6
Methyl acrylate	96-33-3
tert-Butyl acrylate	1663-39-4
Tetrahydrofurfuryl acrylate	2399-48-6
Tricyclododecane dimethanol diacrylate	42594-17-2
Trimethylolpropane triacrylate	15625-89-5
Tripropylene glycol diacrylate	42978-66-5

Alkylphenol Ethoxylates and Alkylphenols (APEO/AP)	CAS Number
Nonylphenol ethoxylate	127087-87-0
Nonylphenol ethoxylate	68412-54-4
Nonylphenol ethoxylate	37205-87-1
Nonylphenol ethoxylate	26027-38-3
n-Nonylphenol	25154-52-3
Polyethylene glycol nonylphenyl	9016-45-9
Polyethylene glycol octylphenol ether	9002-93-1
tert-Octylphenol	27193-28-8
Allergenic proteins	**CAS Number**
Crustacean	Not Applicable
Egg	Not Applicable
Fish	Not Applicable
Milk	Not Applicable
Peanut	Not Applicable
Tree nut	Not Applicable
Wheat	Not Applicable
Amines	**CAS Number**
Aminoethylethanolamine (AEEA)	111-41-1
2-Aminoethanol	141-43-5
Diethanolamine	111-42-2
Ethylenediamine	107-15-3
2-Naphthylphenylamine	135-88-6
Asbestos and compounds	**CAS Number**
Asbestos	1332-21-4
Asbestos, actinolite	77536-66-4
Asbestos, amosite	12172-73-5
Asbestos, anthophyllite	77536-67-5

Asbestos, chrysotile	132207-32-0
Asbestos, crocidolite	12001-28-4
Asbestos, hrysotile	12001-29-5
Asbestos, tremolite	77536-68-6
AzoDyes, Arylamines, Anilines	**CAS Number**
2-Amino-4-nitrotoluene	99-55-8
2-Anisidine	90-04-0
2-Naphthylamine	91-59-8
2-Naphthylamine acetate	553-00-4
2-Toluidine	95-53-4
2,4-Diaminotoluene	95-80-7
2,4-Diaminoanisole	615-05-4
2,4-Diaminoanisole sulfate	39156-41-7
2,4-Xylidine	95-68-1
2,4,5-Trimethylaniline	137-17-7
2,4,5-Trimethylaniline hydrochloride	21436-97-5
2,6-Xylidine	87-62-7
3,3'-Dichlorobenzidine	91-94-1
3,3'-Dimethoxybenzidine	119-90-4
3,3'-Dimethyl-4,4'-diaminodiphenylmethane	838-88-0
3,3'-Dimethylbenzidine	119-93-7
4-Aminoazobenzene	60-09-3
4-Aminodiphenyl	92-67-1
4-Chloro-2-toluidine	95-69-2
4-Chloro-2-toluidine hydrochloride	3165-93-3
4-Chloroaniline	106-47-8
4,4'-Diaminodiphenylmethane	101-77-9
4,4'-Methylene-bis-(2-chloroaniline)	101-14-4
4,4'-Oxydianiline	101-80-4

4,4'-Thiodianiline	139-65-1
6-Methoxy-m-toluidine (p-Cresidine)	120-71-8
Benzidine	92-87-5
Diphenylamine	122-39-4
o-Aminoazotoluene	97-56-3
Biocides	**CAS Number**
1,3-Dimethylol-5,5-dimethylhydantoin	6440-58-0
2-(Thiocyanatomethylthio) benzothiazole (TCMTB)	21564-17-0
2-bromo-2-(bromomethyl)pentanedinitrile (DBDCB)	35691-65-7
2-Butanone, peroxide	1338-23-4
2-Chloroacetamide	79-07-2
2-Methyl-1,2-benzisothiazolin-3-one (MBIT)	2527-66-4
3-iodo-2-propynylbutylcarbamate (IPBC)	55406-53-6
4,4-dimethyloxazolidine	51200-87-4
Benzalkonium chloride	8001-54-5
Benzisothiazolone (BIT)	2634-33-5
Bronopol	52-51-7
Carbendazim	10605-21-7
Cetrimonium bromide	57-09-0
Cetrimonium chloride	112-02-7
Chlorocresol	59-50-7
Cu-HDO	312600-89-8
Diazolindinyl urea	78491-02-8
Dichlorooctylisothiazolinone (DCOIT)	64359-81-5
Dichlorophen	97-23-4
Fludioxonil	131341-86-1
Folpet	133-07-3
Glutaraldehyde	111-30-8
Guanidine, N,N'''-1,6-hexanediylbis[N'-cyano-, polymer with 1,6-hexanediamine, hydrochloride	27083-27-8

Imidazolindinyl urea	39236-46-9
Methylchloroisothiazolinone (CIT)	26172-55-4
Methylisothiazolinone (MIT)	2682-20-4
Mixture (3:1) of CIT and MIT	55965-84-9
N-Methylol-chloroacetamide	2832-19-1
n-Octylisothiazolinone (OIT)	26530-20-1
N,N′-methylenebismorpholine (MBM)	5625-90-1
O-Phenylphenol	90-43-7
Permethrin	52645-53-1
Propiconazole	60207-90-1
Quaternium-15	4080-31-3
Tebuconazole	107534-96-3
Thiourea	62-56-6
Tolylfluanid	731-27-1
Triclosan	3380-34-5
Bisphenols	**CAS Number**
2,2'-Bisphenol F	2467-02-9
4,4'-Methylenebis(phenol) (Bisphenol F)	620-92-8
4,4'-Dihydroxybiphenyl	92-88-6
4,4'-Dihydroxydiphenyl ether	1965-09-9
Bisphenol A	80-05-7
Bisphenol AF (BPAF)	1478-61-1
Bisphenol AP (BPAP)	1571-75-1
Bisphenol B (BPB)	77-40-7
Bisphenol BP (BPBP)	1844-01-5
Bisphenol C (BPC)	79-97-0
Bisphenol C2 (BPC2)	14868-03-2
Bisphenol E (BPE)	2081-08-5
Bisphenol F	1333-16-0

Bisphenol FL (BPFL)	3236-71-3
Bisphenol M (BPM)	13595-25-0
Bisphenol P (BPP)	2167-51-3
Bisphenol PH (BPPH)	24038-68-4
Bisphenol S	80-09-1
Bisphenol Z (BPZ)	843-55-0
Chlorinated Aromatic Hydrocarbons	**CAS Number**
1,2-Dichlorobenzene	95-50-1
1,2,3-Trichlorobenzene	87-61-6
1,2,3,4-Tetrachlorobenzene	634-66-2
1,2,3,5-Tetrachlorobenzene	634-90-2
1,2,4-Trichlorobenzene	120-82-1
1,2,4,5-Tetrachlorobenzene	95-94-3
1,3-Dichlorobenzene	541-73-1
1,3,5-Trichlorobenzene	108-70-3
1,4-Dichlorobenzene	106-46-7
2-Chlorotoluene	95-49-8
2,3,4,5-Tetrachlorotoluenes	1006-32-2
2,3,4,6-Tetrachlorotoluenes	875-40-1
2,3,5,6-Tetrachlorotoluenes	1006-31-1
2,3,6-Trichlorotoluene	2077-46-5
2,4-Dichlorotoluene	95-73-8
2,4,5-Trichlorotoluene	6639-30-1
2,6-Dichlorotoluene	118-69-4
3-Chlorotoluene	108-41-8
3,4-Dichlorotoluene	95-75-0
4-Chlorotoluene	106-43-4
a,a,a-Trichlorotoluene	98-07-7
a,a,a,2-Tetrachlorotoluene	2136-89-2
a,a,a,4-Tetrachlorotoluene	5216-25-1

Alpha,Alpha,2,6-Tetrachlorotoluene	81-19-6
Benzyl chloride	100-44-7
Dichlorobenzenes, including isomers	Several
Dichlorotoluenes, including isomers	Several
Hexachlorobenzene	118-74-1
Monochlorobenzene	108-90-7
Monochlorotoluenes, including isomers	Several
Pentachlorobenzene	608-93-5
Pentachlorotoluene	877-11-2
Tetrachlorobenzenes, including isomers	Several
Tetrachlorotoluenes, including isomers	Several
Trichlorobenzenes, including isomers	Several
Trichlorotoluenes, including isomers	Several
Chlorinated Paraffins	**CAS Number**
Alkanes, C10-13, chloro	85535-84-8
Alkanes, C10-21, chloro	84082-38-2
Alkanes, C12-13, chloro	71011-12-6
Alkanes, C12-14, chloro	85536-22-7
Alkanes, C14-17, chloro	85535-85-9
Alkanes, C18-28, chloro	85535-86-0
Chlorinated Phenols	**CAS Number**
2,3,4,5-Tetrachlorophenol (2,3,4,5-TeCP)	4901-51-3
2,3,4,6-Tetrachlorophenol (2,3,4,6-TeCP)	58-90-2
2,3,5-Trichlorophenol (2,3,5-TCP)	933-78-8
2,3,5,6-Tetrachlorophenol (2,3,5,6-TeCP)	935-95-5
2,3,6-Trichlorophenol (2,3,6-TCP)	933-75-5
2,4,6-Trichlorophenol (2,4,6-TCP)	88-06-2
3,4,5-Trichlorophenol (3,4,5-TCP)	609-19-8
Pentachlorophenol	87-86-5

Tetrachlorophenol, including isomers	25167-83-3
Trichlorophenol, including isomers	25167-82-2

Colorants	CAS Number
4-Amino-3-fluorophenol	399-95-1
Acid Red 26	3761-53-3
Acid Violet 49	1694-09-3
Basic Blue 26	2580-56-5
Basic Red 9	569-61-9
Basic Violet 1	8004-87-3
Basic Violet 14	632-99-5
Basic Violet 3	548-62-9
Basic Violet 3	548-62-9, 603-48-5, 14426-25-6
D&C Orange No. 17	3468-63-1
D&C Red No. 19	81-88-9
D&C Red No. 8	2092-56-0
D&C Red No. 9	5160-02-1
Direct Black 38	1937-37-7
Direct Blue 6	2602-46-2
Direct Red 28	573-58-0
Direct Yellow 1	6472-91-9
Disperse Blue 1	2475-45-8
Disperse Blue 102	12222-97-8
Disperse Blue 106	12223-01-7
Disperse Blue 124	61951-51-7
Disperse Blue 26	3860-63-7
Disperse Blue 3	2475-46-9
Disperse Blue 35	12222-75-2
Disperse Blue 7	3179-90-6
Disperse Brown 1	23355-64-8
Disperse Orange 1	82-28-0
Disperse Orange 1	2581-69-3
Disperse Orange 149	85136-74-9

Disperse Orange 3	730-40-5
Disperse Orange 37/59/76	12223-33-5
Disperse Red 1	2872-52-8
Disperse Red 1	2872-48-2
Disperse Red 17	3179-89-3
Disperse Yellow 1	119-15-3
Disperse Yellow 23	6250-23-3
Disperse Yellow 3	2832-40-8
Disperse Yellow 39	12236-29-2
Disperse Yellow 49	54824-37-2
Disperse Yellow 9	6373-73-5
Disperse Yellow 64	10319-14-9
Malachit Green	10309-95-2
Navy Blue	118685-33-9
Pigment Black 25	68186-89-0
Pigment Red 104	12656-85-8
Pigment Yellow 157	68610-24-2
Pigment Yellow 34	1344-37-2
Solvent Blue 4	6786-83-0
Solvent Yellow 14	842-07-9
Cyclic Siloxanes	**CAS Number**
Decamethylcyclopentasiloxane (D5)	541-02-6
Dodecamethylcyclohexasiloxane (D6)	540-97-6
Octamethylcyclotetrasiloxane (D4)	556-67-2
Dioxins and Furans	**CAS Number**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0

1,2,3,4,7,8-Hexabromodibenzo-p-dioxin	110999-44-5
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7
1,2,3,6,7,8-Hexabromodibenzo-p-dioxin	110999-45-6
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9
1,2,3,7,8-Pentabromodibenzo-p-dioxin	109333-34-8
1,2,3,7,8-Pentabromodibenzofuran	107555-93-1
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6
1,2,3,7,8,9-Hexabromodibenzo-p-dioxin	110999-46-7
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5
2,3,4,7,8-Pentabromodibenzofuran	131166-92-2
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4
2,3,7,8-Tetrabromodibenzo-p-dioxin	50585-41-6
2,3,7,8-Tetrabromodibenzofuran	67733-57-7
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9
Flame Retardants	**CAS Number**
2-Ethylhexyl-2,3,4,5-tetrabromobenzoate	183658-27-7
Bis(2-ethylhexyl)-3,4,5,6- tetrabromophthalate	26040-51-7
Bis(2,3-dibromopropyl) phosphate	5412-25-9
Decabromodiphenyl ether (DecaBDE)	1163-19-5

Heptabromodiphenyl ether (HeptaBDE)	68928-80-3
Hexabromocyclododecanes (HBCDDs)	25637-99-4
Hexabromodiphenyl ether (HexaBDE)	36483-60-0
Octabromodiphenyl ether (OctaBDE)	32536-52-0
Pentabromodiphenyl ether (PentaBDE)	32534-81-9
Tetrabromobisphenol A	79-94-7
Tetrabromodiphenyl ether (TetraBDE)	40088-47-9
Tri-iso-butylphosphate	126-71-6
Triethylenephosphoramide (TEPA)	545-55-1
Tris(1,3-Dichloro-2-propyl) phosphate	13674-87-8
Tris(2,3-dibromopropyl)phosphate (TRIS)	126-72-7
Tris(chloroethyl)phosphate	115-96-8
Glycidyl Ether Monomers	**CAS Number**
1,6-Hexanediol Diglycidyl Ether (HDDGE)	16096-31-4
Allyl Glycidyl Ether (AGE)	106-92-3
Butanediol diglycidyl ether	2425-79-8
Diglycidyl Ether	2238-07-5
Diglycidyl Ether of Bisphenol A (BADGE)	1675-54-3
Glycidyl Neodeconate	26761-45-5
Isopropyl Glycidyl Ether	4016-14-2
n-Butyl Glycidyl Ether (BGE)	2426-08-6
Octyl-Decyl Glycidyl Ether	68609-96-1
p-tert-Butylphenyl Glycidyl Ether	3101-60-8
Phenyl Glycidyl Ether	122-60-1
Triglycidyl Glycerol Ether (TGE)	13236-02-7
Halogenated Biphenyls,Terphenyls, and Naphthalenes	**CAS Number**
Polybrominated biphenyls (PBBs)	59536-65-1
Polybrominated naphthalenes (PBNs)	Several
Polybrominated terphenyls (PBTs)	Several

Polychlorinated biphenyls (PCBs)	1336-36-3
Polychlorinated napthalenes (PCNs)	70776-03-3
Polychlorinated terphenyls (PCTs)	61788-33-8
Halogenated Diarylalkanes	**CAS Number**
Monomethyl-dibromo-diphenyl methane	99688-47-8
Monomethyl-dichloro-diphenyl methane	8161-70-8
Monomethyl-tetrachloro-diphenyl methane	76253-60-6
Halogens	**CAS Number**
Bromine, total	7726-95-6
Chlorine, total	7782-50-5
Isocyanates	**CAS Number**
2,4-/2,6-TDI mixture	26471-62-5
2,6-Diisopropylphenyl-isocyanate	28178-42-9
4,4-Methylendicyclohexyl-di-isocyanate (4,4-MDI)	5124-30-1
Diphenylmethane-2,2-di-isocyanate (2,2-MDI)	2536-05-2
Diphenylmethane-2,4-di-isocyanate (2,4-MDI)	5873-54-1
Diphenylmethane-4,4-di-isocyanate (MDI)	101-68-8
Hexamethylene diisocyanate (HMDI)	822-06-0
Isophorone diisocyanate (IPDI)	4098-71-9
MDI mixed isomers	26447-40-5
Napthylene-1,5-di-isocyanate (1,5-NDI)	3173-72-6
Phenylisocyanate	103-71-9
Technical grade MDI	9016-87-9
Tetramethylxylene diisocyanate (TMXDI)	2778-42-9
Toluene-2,4-diisocyanate (2,4-TDI)	584-84-9
Toluene-2,6-diisocyanate (2,6-TDI)	91-08-7
Metals	**CAS Number**
Antimony	7440-36-0
Arsenic	7440-38-2

Barium (soluble)	7440-39-3
Beryllium	7440-41-7
Cadmium	7440-43-9
Chromium VI (Cr6+)	18540-29-9
Chromium, extractable	7440-47-3
Cobalt	7440-48-4
Copper	7440-50-8
Lead	7439-92-1
Mercury	7439-97-6
Nickel	7440-02-0
Tin	7440-31-5
Methacrylates	**CAS Number**
Butyl methacrylate	97-88-1
Ethyl methacrylate	97-63-2
Isobornyl methacrylate	7534-94-3
Isobutyl methacrylate	97-86-9
Methacrylic acid	79-41-4
Methyl methacrylate	80-62-6
Methyl-phenol compounds	**CAS Number**
Cresol	1319-77-3
o-Cresol	95-48-7
m-Cresol	108-39-4
p-Cresol	106-44-5
N-Nitrosamines	**CAS Number**
N-Nitrosodibutylamine	924-16-3
N-Nitrosodiethanolamine	1116-54-7
N-Nitrosodiethylamine	55-18-5
N-Nitrosodiisopropylamine	601-77-4

N-Nitrosodimethylamine	62-75-9
N-Nitrosodiphenylamine	86-30-6
N-Nitrosodipropylamine	621-64-7
N-Nitrosoethylphenylamine	612-64-6
N-nitrosohexamethyleneimine (NHMI)	932-83-2
N-Nitrosomethylethylamine	10595-95-6
N-Nitrosomethylphenylamine	614-00-6
N-Nitrosomorpholine	59-89-2
N-Nitrosopiperidine	100-75-4
N-Nitrosopyrrolidine	930-55-2
Organotin Compounds	**CAS Number**
Dibutyltin (DBT)	Several
Dibutyltin Dichloride	683-18-1
Dioctyltin (DOT)	Several
Monobutyltin (MBT)	Several
Monooctyltin (MOT)	Several
Tetrabutyltin (TeBT)	Several
Tetraoctyltin (TeOT)	Several
Tributyltin (TBT)	Several
Tributyltin Oxide	56-35-9
Tricyclohexyltin (TCyT)	Several
Triphenyltin (TPhT)	Several
Triphenyltin Hydroxide	76-87-9
Perchlorates	**CAS Number**
Ammonium perchlorate	7790-98-9
Lithium perchlorate	7791-03-9
Magnesium perchlorate	10034-81-8
Potassium perchlorate	7778-74-7
Sodium perchlorate	7601-89-0

Perfluorinated Compounds	CAS Number
Perfluorooctanoic Acid (PFOA), salts and related substances	Including but not limited to compounds on pages 79-81 in the reference link. Norway FOR-2004-06-01-922 EU 2017/1000 http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?doclanguage=en&cote=env/jm/mono(2006)15
Perfluorooctane Sulfonates (PFOS) and derivatives	Including but not limited to compounds on pages 24-44 in reference link. 2004/850/EU http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?doclanguage=en&cote=env/jm/mono(2006)15
Per- and polyfluoroalkyl substances (PFAS)	Including but not limited to compounds on pages 45-78 in the reference link. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?doclanguage=en&cote=env/jm/mono(2006)15
Perfluorohexanoic Acid (PFHxA), salts and related substances	Including but not limited to compounds listed in the reference link. https://echa.europa.eu/documents/10162/7da473c1-7f27-df34-9e6a-46152ef10d4b
Perfluorobutane sulfonic acid (PFBS) and compound	Including but not limited to the list of compounds on pages 14, 15, 24, and 25 in the reference link. https://www.miljodirektoratet.no/globalassets/publikasjoner/M759/M759.pdf
Perfluorohexane Sulfonic Acid (PFHxS), salts and related substances	Including but not limited to compounds listed on pages 168-192 in the reference link. https://echa.europa.eu/documents/10162/a22da803-0749-81d8-bc6d-ef551fc24e19
C9-C14 PFCAs, salts and related substances	Including but not limited to compounds listed on pages 31, 56, and 198-205 in the reference link. https://echa.europa.eu/documents/10162/2ec5dfdd-0e63-0b49-d756-4dc1bae7ec61

Pesticides	CAS Number
2-(2,4,5-Trichlorophenoxy)propionic acid, salts and compounds	93-72-1
2,4-Dichlorophenoxyacetic acid, its salts and compounds	94-75-7
2,4,5-Trichlorophenoxyacetic acid, salts and compounds	93-76-5
Aldrin	309-00-2
Azinphos ethyl	2642-71-9
Azinphos methyl	86-50-0
Bromophos-ethyl	4824-78-6
Captafol	2425-06-1
Carbaryl	63-25-2
Chlordane	57-74-9
Chlordecone	143-50-0
Chlordimeform	6164-98-3
Chlorfenvinphos	470-90-6
Coumaphos	56-72-4
Cyfluthrin	68359-37-5
Cyhalothrin—lambda	91465-08-6
Cypermethrin	52315-07-8
Deltamethrin	52918-63-5
Demeton	919-86-8
Diazinon	333-41-5
Dichlorprop	120-36-5
Dicrotophos	141-66-2
Dieldrine	60-57-1
Dimethoate	60-51-5
Dinoseb and salts	88-85-7
Endosulfan, alpha	959-98-8
Endosulfan, beta	33213-65-9
Endrine	72-20-8

Esfenvalerate	66230-04-4
Ethyl parathion	56-38-2
Fenvalerate	51630-58-1
Heptachlor	76-44-8
Heptachloroepoxide	1024-57-3
Hexachlorobenzene	118-74-1
Hexachlorocyclohexane (HCH), including isomers	608-73-1
Isodrin	465-73-6
Kelevane	4234-79-1
Lindane	58-89-9
Malathion	121-75-5
MCPA	94-74-6
MCPB	94-81-5
Mecoprop	93-65-2
Methamidophos	10265-92-6
Methoxychlor	72-43-5
Methyl parathion	298-00-0
Mevinophos	7786-34-7
Mirex	2385-85-5
Monocrotophos	6923-22-4
o,p'-Dichlorodiphenyldichloroethane (o,p'-DDD)	53-19-0
o,p'-Dichlorodiphenyldichloroethylene (o,p'- DDE)	3424-82-6
o,p'-Dichlorodiphenyltrichloroethane (o,p'-DDT), including isomers	789-02-6
p,p'-Dichlorodiphenyldichloroethane (p,p'-DDD)	72-54-8
p,p'-Dichlorodiphenyldichloroethylene (p,p'- DDE)	72-55-9
p,p'-Dichlorodiphenyltrichloroethane (p,p'-DDT), including isomers	50-29-3
Perthane	72-56-0
Profenophos	41198-08-7
Propetamphos	31218-83-4

Quinalphos	13593-03-8
Quintozene (pentachlorobenzene)	82-68-8
Strobane	8001-50-1
Telodrin	297-78-9
Toxaphene	8001-35-2
Tribufos (DEF)	78-48-8
Trifluralin	1582-09-8
Photoinitiators	**CAS Number**
Methyl phenylglyoxalate	15206-55-0
Phthalates	**CAS Number**
1,2-Benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-Benzenedicar- boxylic acid, mixed decyl and hexyl and octyl diesters with ≥ 0.3% of dihexyl phthalate	68515-51-5; 68648-93-1
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)	71888-89-6
1,2-Benzenedicarboxylic acid, di-C7-1-branched and linear alkyl esters (DHNUP)	68515-42-4
1,2-Benzenedicarboxylic acid, dipentylester, branched and linear (DPP)	84777-06-0
Bis-(2-methoxyethyl) phthalate (DMEP)	117-82-8
Butylbenzyl phthalate (BBP)	85-68-7
Di-iso-pentyl phthalate (DIPP)	605-50-5
Di-isodecyl phthalate (DIDP)	68515-49-1 / 26761-40-0
Di-n-hexyl phthalate (DnHP)	84-75-3
Di-n-Octyl phthalate (DNOP)	117-84-0
Di-n-pentyl phthalate (DnPP)	131-18-0
Dibutyl phthalate (DBP)	84-74-2
Dicyclohexyl phthalate (DCHP)	84-61-7
Diethyl phthalate (DEP)	84-66-2
Diethylhexyl phthalate (DEHP)	117-81-7
Diisobutyl phthalate (DIBP)	84-69-5
Diisononyl phthalate (DINP)	28553-12-0 / 68515-48-0
Dimethyl phthalate (DMP)	131-11-3

Diundecyl phthalate (DuDP)	3648-20-2
n-Pentyl-isopentyl phthalate (nPIPP)	776297-69-9
Polycyclic Aromatic Hydrocarbons (PAHs)	**CAS Number**
5-Methylchrysene	3697-24-3
7H-Dibenzo(c,g)carbazole	194-59-2
Acenaphthene	83-32-9
Acenaphthylene	208-96-8
Anthracene	120-12-7
Benzo(a)anthracene	56-55-3
Benzo(r,s,t)pentaphene	189-55-9
Benzo[a]pyrene	50-32-8
Benzo[b]fluoranthene	205-99-2
Benzo[e]pyrene	192-97-2
Benzo[g,h,i]perylene	191-24-2
Benzo[j]fluoranthene	205-82-3
Benzo[k]fluoranthene	207-08-9
Chrysene	218-01-9
Dibenz(a,h)acridine	226-36-8
Dibenz(a,j)acridine	224-42-0
Dibenzo(a,e)fluoranthene	5385-75-1
Dibenzo(a,e)pyrene	192-65-4
Dibenzo(a,h)pyrene	189-64-0
Dibenzo(a,l)pyrene	191-30-0
Dibenzo[a,h]anthracene	53-70-3
Fluoranthene	206-44-0; 93951-69-0
Fluorene	86-73-7
Indeno[1,2,3-cd]pyrene	193-39-5

Naphthalene	91-20-3
Phenanthrene	85-01-8
Pyrene	129-00-0; 1718-52-1
Solvents	**CAS Number**
2-Ethoxyethanol	110-80-5
2-Ethoxyethyl acetate	111-15-9
2-Methoxyethanol	109-86-4
2-Methoxyethyl acetate	110-49-6
2-Xylene/o-Xylene	95-47-6
3-Xylene/m-Xylene	108-38-3
4-Xylene/p-Xylene	106-42-3
Acrylonitrile	107-13-1
Benzene	71-43-2
Carbon disulfide	75-15-0
Dimethylfumarate (DMFu)	624-49-7
Dimethylacetamide (DMAc)	127-19-5
Methyl Isobutyl Ketone (MIBK)	108-10-1
N-Methylpyrrolidone (NMP)	872-50-4
N,N-Dimethylformamide (DMF)	68-12-2
Toluene	108-88-3
Trichloroethylene	79-01-6
Xylene	1330-20-7
UV stabilizers	**CAS Number**
UV 320	3846-71-7
UV 327	3864-99-1
UV 328	25973-55-1
UV 350	36437-37-3
Others	**CAS Number**
Benzenamine, N-phenyl-, reaction products with styrene and 2, 4, 4-trimethylpentene (BNST)	68921-45-69
Benzyl Alcohol	100-51-6
Boric Acid	10043-35-3
Epichlorohydrin	106-89-8

Estragole	140-67-0
Phenolphthalein	77-09-8
Quinoline	91-22-5
Radioactive Substances	Several
Styrene	100-42-5
Triphenyl Phosphate	115-86-6
2-phenyl-2-propanol	617-94-7
Butylated Hydroxytoluene	128-37-0
Diphenylthiourea	102-08-9
Formaldehyde	50-00-0
Hexamethylenetetramine	100-97-0
Latex, natural rubber	Latex Proteins
Mercaptobenzothiazole	149-30-4
p-Phenylenediamine	106-50-3
Polyvinylchloride (PVC)	9002-86-2
Selenium	7782-49-2

References

In addition to Apple's own review and analysis, some of the chemicals on the restricted list were derived from the references below.

Apple Regulated Substances Specification, Apple Inc.

ASTM D6499: Standard Test Method for the Immunological Measurement of Antigenic Protein in Natural Rubber and Its Products.

bluesign® system substances list (BSSL): Consumer Safety Limits. bluesign technologies ag. www.bluesign.com.

California Prop 65: The Safe Drinking Water and Toxic Enforcement Act of 1986, California Health and Safety Code, Division 20, Chapter 6.5, sections 25249.5 through 252491.3. Websites: http://oehha.ca.gov/prop65/prop65_list/Newlist.html; www.oehha.org/prop65/getNSRLs.html.

CAS Number: Chemical Abstract Service registry numbers that identify unique substances.

CLP Regulation (Classification, Labelling and Packaging) Regulation (EC) No 1272: Complements REACH Directive and replaces the Dangerous Substances Directive (67/548/EEC) and the Dangerous Preparations Directive (1999/45/EC).

DIN CEN/TS 15968: Determination of extractable perfluorooctanesulfonate (PFOS) in coated and impregnated solid articles, liquids, and firefighting foams—Method for sampling, extraction, and analysis by LC-qMS or LC-tandem/MS.

DIN EN ISO 18254: Textiles—Method for the detection and determination of a lkylphenolethoxylates (APEO).

DIN 54232: Textiles—Determination of the content of bonds based on chlorobenzene and chlorotoluene or Solvent Extraction // GC-MS.

DIN 54321: Testing of textiles—Determination of felting shrinkage for assessing the felting behavior of single and plied yarns made from wool or containing wool by a washing test. Used to identify colorants.

EHCA website for list of SVHC: http://echa.europa.eu/candidate-list-table.

EN 71-3: Safety of toys—Migration of certain elements.

EN 1122: Plastics—Determination of cadmium—Wet decomposition method.

prEN 16711-2: Textiles—Determination of metal content—Part 2: Determination of metals extracted by acidic artificial perspiration solution. (Use draft standard until finalized.)

EN 1811+AC:2012: Reference test method for release of nickel from all post assemblies which are articles intended to come into direct and prolonged contact with the skin. Replaces BS EN 181:1998+A1:2008.

EN 12472: Method for the simulation of wear and corrosion for the detection of nickel release from coated items.

EN 12868: Methods for determining the release of N-nitrosamines and N-nitrosatable substances from elastomer rubber, 1999.

EN 13130-8: Determination of isocyanates in plastics, 2004.

EN 14362-1: Textiles—Methods for determination of certain aromatic amines derived from azo colorants—Part 1:Detection of the use of certain azo colorants accessible with and without extracting the fibres.

EN 14362-3: Textiles—Methods for determination of certain aromatic amines derived from azo colorants. Detection of the use of certain azo colorants, which may release 4-aminoazobenzene.

EN 14582: Characterization of waste. Halogen and sulfur content. Oxygen combustion in closed systems and determination methods. British Standards Institute, 2007.

EN ISO 17075: Leather—Chemical tests—Determination of Chromium(VI) content (ISO17075).

EPA 8081B: Organochlorine Pesticides by Gas Chromatography.

EPA 8151A: Chlorinated Herbicides Analysis by GC Using Methylation or Pentafluorobenzylation Derivatization.

Commission Regulation (EU) No 757/2010 of 24 August 2010: Amending Regulation (EC) No 850/2004 of the European Parliament and of the Council on persistent organic pollutants (perfluorooctane sulfonates).

IEC 62321: Determination levels of six regulated substances (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, polybrominated diphenyl ethers).

ISO 3613: Metallic and other inorganic coatings—Chromate conversion coatings on zinc, cadmium, aluminum-zinc alloys, and zinc-aluminum alloys—Test methods.

ISO 13365: Leather—Chemical tests—Determination of the preservative (TCMTB, PCMC, OPP, OIT, etc.) content in leather by liquid chromatography.

ISO 14184-1: Textiles—Determination of formaldehyde content—Part 1: Free and hydrolyzed formaldehyde (water extraction method).

ISO 14362-1: Textiles—Methods for determination of certain aromatic amines derived from azo colorants—Part 1:Detection of the use of certain azo colorants accessible with and without extracting the fibres.

ISO 14389: Textiles—Determination of the phthalate content—Tetrahydrofuran method.

ISO/TS 16179: Footwear—Critical substances potentially present in footwear and foot- wear components—Determination of organotin compounds in footwear materials.

ISO/TS 16186: Footwear—Critical substances potentially present in footwear and footwear components—Test method to quantitatively determine dimethyl fumarate (DMFu) in footwear materials.

ISO 17070: Leather—Chemical tests—Determination of pentachlorophenol content.

ISO 17072-1: Leather—Chemical determination of metal content—Part 1: Extractable metals.

ISO 17226-1: Leather—Chemical determination of formaldehyde content—Part 1: Method using high-performance liquid chromatography.

ISO 17234-1: Leather—Chemical tests for the determination of certain azo colorants in dyed leathers—Part 1:Determination of certain aromatic amines derived from azo colorants.

ISO 17234-2: Leather—Chemical tests for the determination of certain azo colorants in dyed leathers—Part 2: Determination of 4-aminoazobenzene.

ISO 17353: Water quality—Determination of selected organotin compounds—Gas chromatographic method.

ISO 18218-1: Leather—Determination of ethoxylated alkylphenols—direct method.

ISO 18218-2: Leather—Determination of ethoxylated alkylphenols—indirect method.

ISO 18219: Leather—Determination of chlorinated hydrocarbons in leather— Chromatographic method for short-chain chlorinated paraffins (SCCP).

REACH: Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH).

REACH Annex XVII: Annex XVII of Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH).

§ 64 LFGB—82.02-8: Textiles—Detection of chlorinated phenols.

ZEK 01.4-08: Testing and Validation of Polycyclic Aromatic Hydrocarbons (PAH) in the course of GS-Mark Certification.