

REI

RESTRICTED SUBSTANCES LIST

For Substances in Finished Apparel Products

Version 2: May 2004

The Restricted Substances List consists of three parts:

1) Primary Restricted Substances List

Substances that appear on this list are based on global legislation, have been used in textile processing and have been found in finished products. Substances listed should be restricted in products according to the limits and test methods provided.

2) Supplementary List

Substances that appear on this list are based on global legislation and should be restricted, but are not commonly found in finished products.

3) Of Concern

Substances that appear on this list are not restricted in apparel products by global legislation, but may be based on potential legislation or voluntary restriction by some companies.

Notes:

Test Methods and Detection Limits: In cases where the law does not specify a test method, the companies have recommended those tests they find to produce reliable results to meet the limit. Where a substance is prohibited or banned, the limit is listed as "not detected" and a test method detection limit is given for allowable

Updates: Companies should track legislation to ensure the most current laws, limits and test methods. Future updates of the RSL may be published on www.bsr.org/rsl.

PRIMARY LIST OF RESTRICTED SUBSTANCES IN APPAREL PRODUCTS						
REI - May 2004						
Substances that appear on this list are listed on public legislation. Have been used in textile processing and have been found in finished products. Substances listed should be restricted in products accessible to the public under normal conditions.						
Substance	CAS Number	Restricted Limit	Source of Legislation	Possible test method for analysis of the final garment	Typical sources	Notes
Acids						
Acetic acid Use in the reduction cleavage of low or more acid groups may release one or more of the acetates listed below:			Law: European Union Directive 2002/95/EC of the European Parliament and of the Council of 19 July 2002 amending the previously Council Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations (hazardous)	Testes: EN 14062-1 Proprietary: EN 14062-2 Leather: ISO 17234	Acid dyes used in textile dyeing processes (not including pigment dyes)	
Acetic acid	60-32-8	0.1g/kg				
Acetic anhydride	108-24-7	0.1g/kg				
Acetic acid solution	60-32-8	0.1g/kg				
Acetylacetone	17-55-9	0.1g/kg				
Acetylacetonate	17-55-9	0.1g/kg				
Acetylacetone	106-47-6	0.1g/kg				
Acetylacetone	115-07-4	0.1g/kg				
Acetylacetonophenone	17-55-9	0.1g/kg				
Acetylacetonophenone	17-55-9	0.1g/kg				
Acetylacetone	108-24-7	0.1g/kg				
Acetylacetone	106-47-6	0.1g/kg				
Acetylacetone	115-07-4	0.1g/kg				
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Acetylacetone	115-07-4	0.1g/kg				
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SUPPLEMENTARY LIST OF RESTRICTED SUBSTANCES IN APPAREL PRODUCTS						
REI - May 2004						
Substances that appear on this list are based on global legislation and should be restricted, but are not commonly found in finished products.						
Substance	CAS Number	Restricted Limit	Source of Legislation	Possible test method for analysis of the final garment	Typical sources	Notes
Arsenic and its compounds	7440-38-2	Not detected	Law: Switzerland 813.39, article 1 Implementation Date: 10/11/1998	EN ISO 105-E04 [Test method detection limit 0.2 mg/kg]	May be residual from processing of polyester fibers.	
Asbestos Actinolite Amosite Anthrophyllite Chrysotile Crocidolite Tremolite	77536-66-4 12172-73-5 77536-67-5 12001-29-5 12001-28-4 77536-68-6	Not detected	Law: EU Council Directive 76/769/EEC Implementation Date: 1/1/1991	Microscopic examination; minimum magnification 1-250, polarized light filter attached. Ratio of fiber length to diameter is at least 3:1	Asbestos is a naturally occurring group of fibrous silicate minerals. These thin, long, and flexible fibers can be woven into textiles. Asbestos fibers are strong, durable and fire resistant.	
Dioxins and Furans		Limits based on sum of substances by group as specified below.	Law: German Chemikalienverbots Verordnung (4) Dioxine Implementation Date: 1/1/1996	US EPA 8290	Possible impurity in some halogenated aromatic chemicals such as flame retardants and biocides. Avoid transfer of traces of dioxins and furans when fabrics are processed on direct gas heated steamers, which have been used for other processes involving volatile halogen containing substances.	
Group 1) 2,3,7,8-Tetrachloro-dibenzo-p-dioxin 1,2,3,7,8-Pentachloro-dibenzo-p-dioxin 2,3,7,8-Tetrachlorodibenzofuran 2,3,4,7,8-Pentachlorodibenzofuran	1746-01-6 40321-76-4 51207-31-9 57117-31-4	Sum of Group 1: 1 ug/kg				
Dioxins and Furans (continued)						
Group 2) 1,2,3,4,7,8-Hexachloro-dibenzo-p-dioxin 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin 1,2,3,7,8-pentachlorodibenzofuran 1,2,3,4,7,8-Hexachlorodibenzofuran 1,2,3,7,8,9-Hexachlorodibenzofuran 1,2,3,6,7,8-Hexachlorodibenzofuran 2,3,4,6,7,8-Hexachlorodibenzofuran	39227-28-6 19408-74-3 57653-85-7 57117-41-6 70648-26-9 72918-21-9 57117-44-9 60851-34-5	Sum of Group 1 & 2: 5 ug/kg				
Group 3) 1,2,3,4,6,7,8-Heptachloro-dibenzo-p-dioxin 1,2,3,4,6,7,8,9-Octachloro-dibenzo-p-dioxin 1,2,3,4,6,7,8-Heptachloro-dibenzofuran 1,2,3,4,7,8,9-Heptachloro-dibenzofuran 1,2,3,4,6,7,8,9-Octachloro-dibenzofuran	35822-46-9 3268-87-9 67562-30-4 55673-89-7 39001-02-0	Sum of Group 1, 2 & 3: 100 ug/kg				
Group 4) 2,3,7,8-Tetrabromo-dibenzo-p-dioxin 1,2,3,7,8-Pentabromodibenzo-p-dioxin 2,3,7,8-Tetrabromodibenzofuran 2,3,4,7,8-Pentabromodibenzofuran	50585-41-6 109333-34-8 67933-57-7 131166-92-2	Sum of Group 4: 1 ug/kg				
Dioxins and Furans (continued)						
Group 5) 1,2,3,4,7,8-Hexabrom-dibenzo-p-dioxin 1,2,3,7,8,9-Hexabromodibenzo-p-dioxin 1,2,3,6,7,8-Hexabromodibenzo-p-dioxin 1,2,3,7,8-Pentabromodibenzofuran	107555-93-1 no CAS #'s available	Sum of Group 4 & 5: 5 ug/kg				
Persistent Organic Pollutants (POPs)				U.S. EPA Method 8082 or Solvent extraction GC-MS [test method detection limit is 50 ppm]	Used in paints, paper coatings and certain packaging materials. Have the properties of being plasticizers.	
Polychlorinated biphenyls (PCB)	1336-36-3	Not detected	Law: Finish Government Decree on persistent organic substances (735/2002) Ministry of Environment, Helsinki Implementation date: 8/22/2002			Additional (more commonly found) POPs from Finnish legislation are listed below under Pesticides.
Polychlorinated Terphenyls (PCT)	61788-33-8	Not detected	Law: Swedish PCB Ordinance (SFS 1985) Chemical Products Act 1985: 835 Implementation Date: 9/26/1995			
Pesticides		Not detected or 30 ppm (see each specific substance)	Law: Finland: Ministry of Environment Government Decree on persistent organic substances (735/2002) Switzerland: Art. 9, 11, 35 and 61 Ordinance relating to Environmentally Hazardous Substances (Ordinance on Substances) The manufacture, supply, import and use of the following shall be prohibited: a) substances listed under Figure 3b) products which contain substances listed under Figure 3 other than as unavoidable impurities. Implementation Dates: Finland: 8/22/02 Switzerland: 1/1/996 update of 6/9/1986	JIS L1041 (Law 112) or U.S. EPA Method 8081A/ 8151A [Test method detection level is 0.5 mg/kg] No test method given for Finish legislation. Some companies use the Swiss test methods instead.	Natural fiber products	Finnish or Swiss legislation may apply - where both apply, the stricter (Finnish) is indicated.
2-(2,4,5-trichlorophenoxy) propionic acid (2,4,5-TP), its salts and compounds		30ppm	Swiss			
2,4,5-trichlorophenoxyacetic acid (2,4-T), its salts and compounds		30 ppm	Swiss			
Aldrin	309-00-2	Not detected	Finnish			also Swiss
Chlordane	57-74-9	Not detected	Finnish			
Dichloro-diphenyl-dichloro ethane (DDD)	72-54-8	30 ppm	Swiss			
Dichloro-diphenyl-dichloro ethylene (DDE)	72-55-9	30 ppm	Swiss			
Dichloro-diphenyl-trichloro ethane (DDT)	50-29-3	Not detected	Finnish			also Swiss
Dieldrin	60-57-1	Not detected	Finnish			also Swiss
Endrin	72-20-8	Not detected	Finnish			
Hephtachlor	75-44-9	Not detected	Finnish			
Hephtachlor epoxide	1024-57-3	30 ppm	Swiss			
Hexachlorobenzene	118-74-1	Not detected	Finnish			also Swiss
Hexachlorocyclohexane (HCH, all isomers) except gamma-hexachlorocyclohexane	608-73-1	30 ppm	Swiss			
Isodrin	465-73-6	30 ppm	Swiss			
Kelovene	4254-79-1	30 ppm	Swiss			
Pesticides (continued)						
Kapone (Chlordecone)	143-50-0	30 ppm	Swiss			
Lindane	55-89-8	30 ppm	Swiss			
Methoxychlor	72-53-5	30 ppm	Swiss			
Mirex	2385-85-5	Not detected	Finnish			
Perthane	72-56-0	30 ppm	Swiss			
Quintozene	62-69-9	30 ppm	Swiss			
Strobane	8001-50-1	30 ppm	Swiss			
Telodrin	297-78-9	30 ppm	Swiss			
Toxaphene	8001-35-2	Not detected	Finnish			
Solvents			Law: Germany - Chemikalienverbots Verordnung (Prohibition of Chemicals Ordinance), section 16 Implementation Date: 12/31/1994	Head-space for components		
Perchloroethane	76-01-7	0,1 % (mass)				
Carbon tetrachloride	56-23-5	0,1 % (mass)				
1,1,1,2-Tetrachloroethane	630-20-6	0,1 % (mass)				
1,1,2,2-Tetrachloroethane	78-34-5	0,1 % (mass)				

Of Concern LIST OF RESTRICTED SUBSTANCES IN APPAREL PRODUCTS
REI - May 2004

Substances that appear on this list are not restricted in apparel products by global legislation, but may be based on potential legislation or voluntary restriction by some companies.

Substance	CAS Number	Restricted Limit	Source of Legislation (Note: Substances on the Best Practice List may not have associated legislation.)	Possible test method for analysis of the final garment	Typical sources	Notes
Flame Retardents						
Decabromodiphenyl ether (DBDPE or A17Deca-BDE)	1163-19-5	Not Detected	Law: Norwegian legislation Implementation Date: Pending, 2005	Solvent extraction and analysis by LC-DAD [Test method detection limit 5 mg/kg]		
Organotin Compounds						
			Additional Organotin Compounds restricted by some BSR members, but not currently legislated.	Performance-based method of ethanol extraction derivatisation and analysis by GC-MS or LC-MS [test method detection limit is 0.05 ppm]		Resource: http://www.inchem.org/documents/ehc/ehc/ehc015.htm
Dibutyltin (DBT) Compounds: Dibutyltin Dioleate Dibutyltin Mercaptopropioante	13323-62-1 78-06-8	1 ppm				
Tetrabutyl Tin (TeBT)	1461-25-2	Not detected				
Tetraoctyltin (TOT)	3590-84-9	Not detected				
Tricyclohexyltin Hydroxide (TCyHT)	1321-70-5	Not detected				
Phthalates						
di-iso-butylphthalate (DIBP) Dimethylphthalate	84-69-5 131-11-3	500 ppm		Analysis of phthalate esters in plastics, by GC-MS or HPLC-DAD (performance-based method)		Phthalates restricted by law are listed on the Primary RSL. These unlegislated phthalates are restricted by some BSR companies.
Polyvinylchloride (PVC)						
PVC in toys and products intended to be mouthed	9002-86-2	Not detected	EU Green Paper on Environmental Issues of PVC July 2000	Burning test by Beilsteins test and infrared spectroscopy (IR) with or without solvent extraction	PVC can be found in plastic items and trim in apparel and textiles. In addition, PVC can often be found in screen prints and inks.	Several companies have phase-out schedules to eliminate PVC or have banned PVC entirely in all their products. Please note that PVC is not yet restricted by legislation but a ban on certain additives is being considered in the EU, and some are currently restricted (phthalates).
Triclosan						
diphenyl ether (bis-phenyl) derivative, known as either 2,4,4'-Trichloro-2'-hydroxydiphenyl ether or 5-Chloro-2-(2,4-dichlorophenoxy) phenol	3380-34-5		Voluntarily restricted by some BSR companies.	Solvent extraction, derivatisation followed by GC-MS analysis or Potassium Hydroxide extraction with direct LC-MS analysis	Biocide may be used in bedding and clothing, particularly rainwear and rainwear lining, underwear, stockings and sportswear to prevent bacterial growth.	
PFOA						
		Not detected	Voluntarily restricted by some BSR companies.		Fluorinated Polymers, DWR treatments	Currently under review by the EPA in the USA. Norway considering legislation
Alkylphenol ethoxylates						
			Directive 2003/53/EC of the European parliament and of the council			Listed as a toxin in Canada, and legislated in the EU, but not in finished goods as an unintended contaminant
					Detergents. Possibly found in f	
Nonylphenol	25154-52-3					
Nonulphenol ethxylate	9016-45-9					
Octylphenol	27193-28-8					
Octylphenol ethoxylate	9002-93-1					
Bisphenol A						
		80-05-7	OSPAR chemicals of concern		Polycarbonate plastics	