



Apparel and Footwear International RSL Management Group



RESTRICTED SUBSTANCES LIST

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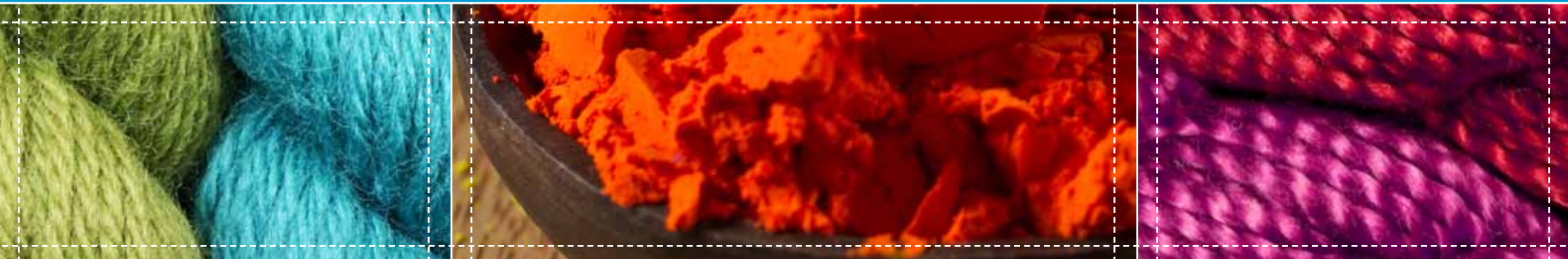


Table of Contents

AFIRM Mission	3
AFIRM Vision	3
Policy Statement	3
Legal Statement	4
Links and References	5
Change Log for the 2017 AFIRM RSL.....	6
Materials in Which Restricted Substances Are Likely to Be Found	7
Definition of Ages	10
AFIRM Restricted Substances List	11
Appendix A: Pesticides, Agricultural	26

AFIRM Mission

AFIRM is the Apparel and Footwear International RSL Management (AFIRM) Working Group, established in 2004. AFIRM's mission is “to reduce the use and impact of harmful substances in the apparel and footwear supply chain.” AFIRM's purpose is to provide a forum to advance the global management of restricted substances in apparel and footwear, communicate information about chemical management to the supply chain, discuss concerns, and exchange ideas for improving chemical management.

AFIRM Vision

AFIRM continues to be a recognized global center of excellence, providing resources to enable continuous advancement of chemical management best practices. We do this based on transparency, science, and collaboration with relevant industries and experts to build safer and more sustainable chemistry within the apparel and footwear supply chains. It is understood that in adopting this vision, AFIRM's mission, objectives, and projects will continue to be product-focused or RSL-related.

Policy Statement and Uses of This RSL

AFIRM has created the following Restricted Substances List to assist and guide supply chain participants seeking to increase product quality and safety or reduce their environmental impact by limiting the use of certain substances (“AFIRM RSL”). AFIRM member brands may differ on individual parameters; suppliers are advised to check with the customer regarding brand-specific requirements. The AFIRM RSL should leverage AFIRM's mission – “to reduce the use and impact of harmful substances in the apparel and footwear supply chain” – by providing a single set of information for maximum and in-depth implementation within the supply chain.

Some examples of uses for the AFIRM RSL, depending on the objectives of the user, include:

- Providing a tool for vendors to establish chemical management knowledge and processes.
- Building base compliance with AFIRM member chemical restrictions.
- Providing a common base for testing products, which may be accepted by multiple AFIRM brands.

AFIRM member companies determine and communicate to their vendors their testing requirements and acceptance of test reports.

For more information about AFIRM, visit www.afirm-group.com.

Legal Statement

The AFIRM RSL constitutes information from AFIRM only and does not represent any individual AFIRM member. Individual brand RSLs may differ in specific parameters.

The AFIRM RSL is not intended to and does not establish any industry standard of care. The AFIRM RSL may not always provide the most appropriate approach for any individual company's chemical management program. Many brands have implementation guidelines, and suppliers must follow those guidelines where required. The AFIRM RSL does not constitute legal advice and is not a substitute for legal advice. There is no warranty, express or implied, as to the completeness or utility of the information contained in this AFIRM RSL, including, without limitation, that the information is current and error-free. AFIRM disclaims liability of any kind whatsoever resulting from any use of or reliance on the AFIRM RSL.

Links and References

Be proactive! These links may provide additional important information and should be visited on a regular basis.

Material definitions and related test parameters

www.afirm-group.com/wp-content/uploads/2013/04/AFIRMSupplierToolkit.pdf

AFIRM Supplier Toolkit

www.afirm-group.com/toolkit/

- Chinese, Vietnamese, and Spanish translations are available

Additional restricted substances with possible relevance

<http://echa.europa.eu>

Candidate list of substances of very high concern (SVHC)

<http://echa.europa.eu/de/candidate-list-table>

Overview of legal chemical limits and country of origin

<https://www.wewear.org/industry-resources/restricted-substances-list/>

Regulated fluorinated greenhouse gases, EC 842/2006

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:161:0001:0011:EN:PDF>

Regulated VOCs, EC 1005/2009

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:286:0001:0030:EN:PDF>

Change Log for the 2017 AFIRM RSL

CAS No.	Substance	Modification	Page
98-86-2	Acetophenone	Test method changed to: Extraction in acetone GC/MS, sonication for 30 minutes at 60 degrees C	11
617-94-7	2-Phenyl-2-Propanol		
Various	Alkylphenol (AP) and Alkylphenol Ethoxylates (APEOs), including all isomers	Test method for textiles changed to: EN ISO 18254-1:2016, determination of AP using LC/MS or GC/MS	11
Various	Azo-amines	Test method for textiles changed to: prEN ISO 14362-1:2015	12
80-05-7	Bisphenol-A	Test method for extraction changed to: 1 g sample/20 ml methanol, sonication for 60 minutes at 70 degrees C	13
Various	Chlorinated Paraffins	Test method changed to: EN ISO 18219:2016	13
Various	Chlorophenols	Test method changed to: 1 M KOH extraction, 12-15 hours at 90 degrees C, derivatization and analysis § 64 LFGB B 82.02-08 or DIN EN ISO 17070:2015	13
68-12-2	Dimethylformamide (DMFa)	Deleted sentence: It has a strong smell in finished products.	15
624-49-7	Dimethylfumarate (DMFu)	Test method changed to: CEN ISO/TS 16186:2012	15
50-00-0	Formaldehyde	Test method for leather changed to: ISO 17226-1:2008 with ISO 17226-2:2008 confirmation method in case of interferences	18
7440-39-3	Heavy Metals, Barium	Added limit of 1000 ppm extractable	19
18540-29-9	Heavy Metals, Chromium VI	Extractable limit revised to: Leather: 3 ppm; Knitted textiles for babies: 0.5 ppm	20
100-42-5	Monomers, Styrene	Added limit of 500 ppm	21
Various	N-Nitrosamines	Added to test method GB/T 24153-2009: Determination using GC/MS or LC/MS/MS	21
Various	Organotin Compounds	Test method changed to: CEN ISO/TS 16179: 2012	21
Various	Ozone-depleting Substances	Test method changed to: GC/MS headspace 120 degrees C for 45 minutes	22
Various	Phthalates	Sample preparation method changed to: CPSC-CH-C1001-09.3	23
Various	Volatile Organic Compounds (VOCs)	Test method changed to: For general VOC screening: GC/MS headspace 120 degrees C, 45 minutes. For DMAC: DIN CEN ISO/TS 16189:2013	25

Materials in Which Restricted Substances Are Likely to Be Found

In the apparel and footwear supply chain, certain types of fibers and materials are more likely to contain restricted substances. Many brands require product testing prior to shipment to ensure that articles are in compliance with their RSL; this information is included in brand-specific requirements.^A

AFIRM Group brands agree on the chemicals included in the AFIRM RSL, the allowable limits, and the test methods. The responsibility for managing testing programs—which specific restricted chemicals should be tested in which specific materials and the frequency of such tests—remains with individual brands.

The risk matrix shown in Table 1, on the next page, highlights the restricted substance risks associated with different fibers and materials, and is presented as a guidance tool. It is based on our many years of experience in manufacturing and in managing restricted substances across a wide range of materials. It uses the following color code:

- 1 Red indicates that a chemical has been in widespread use and/or frequently detected in a particular material.
- 2 Orange indicates that a chemical has been deliberately used and/or detected in a particular material occasionally.
- 3 Yellow indicates there is a very low but theoretical chance that a chemical could be used and/or detected.
- White indicates that we believe there is an almost negligible risk of a chemical being used and/or detected.

The aim of the risk matrix is to provide information on those substances that have historically been deliberately used or found as reagent/contaminants in different materials.^B The matrix does not represent a recommendation for testing, as individual brands and manufacturers need to conduct detailed risk assessments on their own products and components.

The unified approach of the AFIRM RSL will enable member brands to share test data more easily, and we anticipate that the risk matrix will evolve to reflect realistic risks at any given time.

A. See Section 5 of the AFIRM Supplier Toolkit for more information on testing and Appendix C of the AFIRM Supplier Toolkit for a model testing program if your customer does not have one of its own.

B. If a substance is a component of a combined material (for example, a laminated component like polymer material + textile lining), we recommend testing according to different material types.

Materials in Which Restricted Substances Are Likely to Be Found

Table 1. Risk Matrix

Substance	Natural Fibers	Blended Fibers	Synthetic Fibers	Artificial Leather <small>With fiber backing</small>	Natural Leather	Coatings & Prints	Natural Materials <small>Including horns, bones, cork, wood, paper, and straw</small>	Polymers, Plastics, Foams, Natural Rubber & Synthetic Rubber ^C	Metal	Feathers & Down	Glue
Acetophenone and 2-Phenyl-2-Propanol								2 ^D			
Alkylphenol (AP) and Alkylphenol Ethoxylates (APEOs), including all isomers	1	1	1	1	1	1	1	1		3	1
Azo-amines	1	1	1	1	1	1	1			1	
Bisphenol-A								3			
Chlorinated Paraffins, SCCP (C10-C13) and MCCP (C14-C17)	3	3	3	3	1	3		2			
Chlorophenols (Tri-, Tetra-, and Pentachlorophenols)	3	3		3	3	3				3	
Chlororganic Carriers		2	2		3						
Dimethylformamide (DMFa)				2		2					2
Dimethylfumarate (DMFu)	3	3	3	3	3	3		3			
Dyes, Forbidden and Disperse		2	2	2		2					
Dyes, Navy Blue		3	3	3		3					
Flame Retardants	3 (If finish is applied)										
Fluorinated Greenhouse Gases											
Formaldehyde	1	1	1	1	1	1	1				1
Heavy Metals, Chromium VI	3				1						

C. In addition, Styrene (Monomer) is 'Yellow Risk-level 3' for these materials.
 D. 'Red Risk-level 1' applies only to Ethylene-Vinyl Acetate (EVA) foam.

Substance	Natural Fibers	Blended Fibers	Synthetic Fibers	Artificial Leather <small>With fiber backing</small>	Natural Leather	Coatings & Prints	Natural Materials <small>Including horns, bones, cork, wood, paper, and straw</small>	Polymers, Plastics, Foams, Natural Rubber & Synthetic Rubber ^c	Metal	Feathers & Down	Glue
Heavy Metals, Nickel Release									1		
Heavy Metals, Cadmium Total				3		3		3	3		
Heavy Metals, Lead Total				3		3		3 ^E	3		
Heavy Metals, Additional Total (Hg & As)				3		3		3	3		
Heavy Metals, Extractable	2	2	2	2	2	2		2			
N-Nitrosamines								2			
Organotin Compounds	3	3	3	3	3	3		3			3
Ortho-phenylphenol (OPP)	2	2	2	2	2	2					
Ozone-depleting Substances	3										
Perfluorinated and Polyfluorinated Chemicals (PFCs)	2 (If water- or stain-repellant finish is applied)										
Pesticides, Agricultural	3	3			3						
Phthalates				1		1		1			1
Polycyclic Aromatic Hydrocarbons (PAHs)				1		1		1			1
Volatile Organic Compounds (VOCs)	2	2	2	2	2	2		2			2

E. Total Lead in foams is 'Orange Risk-level 2.'

Definition of Ages

Various countries define the terms “babies,” “children,” and “adults” differently. Based on legislation, the age ranges listed in Table 2 satisfy the most restrictive global requirements.

Table 2. Definition of Ages

	Age Range
Babies	0 to 36 months
Children	36 months to 14 years
Adults	14 years and older

AFIRM Restricted Substances List

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Textile Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement
	Acetophenone and 2-Phenyl-2-Propanol			
98-86-2	Acetophenone	50 ppm each	Potential breakdown products in EVA foam when using dicumyl peroxide as a cross-linking agent.	Extraction in acetone GC/MS, sonication for 30 minutes at 60 degrees C
617-94-7	2-Phenyl-2-Propanol			
	Alkylphenol (AP) and Alkylphenol Ethoxylates (APEOs), including all isomers			
104-40-5	Nonylphenol (NP), mixed isomers	Total: 100 ppm	APEOs can be used as or found in detergents, scouring agents, spinning oils, wetting agents, softeners, emulsifying/dispersing agents for dyes and prints, impregnating agents, de-gumming for silk production, dyes and pigment preparations, polyester padding and down/feather fillings.	Textile: EN ISO 18254-1: 2016 with determination of AP using LC/MS or GC/MS Leather: EN ISO 18218-1:2015
11066-49-2				
25154-52-3				
84852-15-3				
140-66-9	Octylphenol (OP), mixed isomers	Total: 100 ppm	APEOs and formulations containing APEOs are prohibited from use throughout supply chain and manufacturing processes. We acknowledge that residual or trace concentrations of APEOs may still be found at levels exceeding 100 ppm and that more time is necessary for the supply chain to phase them out completely. This limit reflects anticipated EU legislation and was set to provide suppliers with advance warning and direction for continuous improvement.	
1806-26-4				
27193-28-8				
9002-93-1	Octylphenol ethoxylates (OPEOs)	Total: 100 ppm		
9036-19-5				
68987-90-6	Nonylphenol ethoxylates (NPEOs)	Total: 100 ppm		
9016-45-9				
26027-38-3				
37205-87-1				
68412-54-4				
127087-87-0				

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Textile Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement
	Azo-amines			
92-67-1	4-Aminobiphenyl	20 ppm each	<p>Azo dyes and pigments are colourants that incorporate one or several azo groups (-N=N-) bound with aromatic compounds. Thousands of azo dyes exist, but only those which degrade to form the listed cleavable amines are restricted. Azo dyes that release these amines are regulated and should no longer be used for dyeing textiles.</p>	<p>Textile: (EU): prEN ISO 14362-1:2015 Leather: (EU): CEN ISO/TS 17234-1:2015 p-Aminoazobenzene: Textile: EN 14362-3:2015 Leather: 17234-2:2011</p>
92-87-5	Benzidine			
95-69-2	4-Chloro-o-toluidine			
91-59-8	2-Naphthylamine			
97-56-3	o-Aminoazotoluene			
99-55-8	2-Amino-4-nitrotoluene			
106-47-8	p-Chloraniline			
615-05-4	2,4-Diaminoanisole			
101-77-9	4,4'-Diaminodiphenylmethane			
91-94-1	3,3'-Dichlorobenzidine			
119-90-4	3,3'-Dimethoxybenzidine			
119-93-7	3,3'-Dimethylbenzidine			
838-88-0	3,3'-dimethyl-4,4'-diaminodiphenylmethane			
120-71-8	p-Cresidine			
101-14-4	4,4'-Methylen-bis(2-chloraniline)			
101-80-4	4,4'-Oxydianiline			
139-65-1	4,4'-Thiodianiline			
95-53-4	o-Toluidine			
95-80-7	2,4-Toluyldiamine			
137-17-7	2,4,5-Trimethylaniline			
95-68-1	2,4 Xylidine			
87-62-7	2,6 Xylidine			
90-04-0	2-Methoxyaniline (= o-Anisidine)			
60-09-3	p-Aminoazobenzene			

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Textile Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement
	Bisphenol-A			
80-05-7	Bisphenol-A (BPA)	1 ppm	Used in the production of epoxy resins, polycarbonate plastics, flame retardants and PVC. Prohibited from use in food and drink containers, and items intended to come into contact with oral cavity.	Sample preparation: Extraction: 1 g sample/20 ml methanol, sonication for 60 minutes at 70 degrees C Measurement: DIN EN ISO 18857-2 (mod)
	Chlorinated Paraffins			
85535-84-8	Short-chain chlorinated Paraffins (SCCP) (C10-C13)	1000 ppm	May be used as flame retardants or as fat liquoring agents in leather production. They also can be used as plasticizers.	EN ISO 18219:2016
85535-85-9	Medium-chain chlorinated Paraffins (MCCP) (C14-C17)	1000 ppm		
	Chlorophenols			
15950-66-0	2,3,4-Trichlorophenol	0.5 ppm each	Chlorophenols are polychlorinated compounds used as preservatives or pesticides. Pentachlorophenol (PCP) and tetrachlorophenol (TeCP) are sometimes used to prevent mould and kill insects when growing cotton and when storing/transporting fabrics. PCP and TeCP can also be used as preservatives in print pastes.	1 M KOH extraction, 12–15 hours at 90 degrees C, derivatization and analysis § 64 LFGB B 82.02-08 or DIN EN ISO 17070:2015
933-78-8	2,3,5-Trichlorophenol			
933-75-5	2,3,6-Trichlorophenol			
95-95-4	2,4,5-Trichlorophenol			
88-06-2	2,4,6-Trichlorophenol			
609-19-8	3,4,5-Trichlorophenol			
4901-51-3	2,3,4,5-Tetrachlorophenol (TeCP)			
58-90-2	2,3,4,6-Tetrachlorophenol (TeCP)			
935-95-5	2,3,5,6-Tetrachlorophenol (TeCP)			
87-86-5	Pentachlorophenol (PCP)			

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Textile Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement
	Chlororganic Carriers			
95-49-8	2-Chlorotoluene	Total: 1 ppm	Chlorobenzenes and chlorotoluenes (chlorinated aromatic hydrocarbons) can be used as carriers in the dyeing process of polyester or wool/ polyester fibres. They can also be used as solvents.	DIN 54232:2010
108-41-8	3-Chlorotoluene			
106-43-4	4-Chlorotoluene			
32768-54-0	2,3-Dichlorotoluene			
95-73-8	2,4-Dichlorotoluene			
19398-61-9	2,5-Dichlorotoluene			
118-69-4	2,6-Dichlorotoluene			
95-75-0	3,4-Dichlorotoluene			
2077-46-5	2,3,6-Trichlorotoluene			
6639-30-1	2,4,5-Trichlorotoluene			
76057-12-0	2,3,4,5-Tetrachlorotoluene			
875-40-1	2,3,5,6-Tetrachlorotoluene			
877-11-2	Pentachlorotoluene			
541-73-1	1,3-Dichlorobenzene			
106-46-7	1,4-Dichlorobenzene			
87-61-6	1,2,3-Trichlorobenzene			
120-82-1	1,2,4-Trichlorobenzene			
108-70-3	1,3,5-Trichlorobenzene			
634-66-2	1,2,3,4-Tetrachlorobenzene			
634-90-2	1,2,3,5-Tetrachlorobenzene			
95-94-3	1,2,4,5-Tetrachlorobenzene			
608-93-5	Pentachlorobenzene			
118-74-1	Hexachlorobenzene			
95-50-1	1,2-Dichlorobenzene	10 ppm		

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Textile Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement
	Dimethylformamide			
68-12-2	Dimethylformamide (DMFa)	500 ppm	DMFa is a solvent used in plastics, rubber, and polyurethane (PU) coating. Water-based PU does not contain DMFa and is therefore preferable.	DIN CEN ISO/TS 16189:2013
	Dimethylfumarate			
624-49-7	Dimethylfumarate (DMFu)	0.1 ppm	DMFu is an anti-mold agent used in sachets in packaging to prevent the buildup of mold, especially during shipping.	CEN ISO/TS 16186:2012

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Textile Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement
	Dyes, Forbidden and Disperse			
2475-45-8	C.I. Disperse Blue 1	75 ppm each	<p>Disperse dyes are a class of water-insoluble dyes that penetrate the fibre system of synthetic or manufactured fibres and are held in place by physical forces without forming chemical bonds. Disperse dyes are used in synthetic fibre (e.g., polyester, acetate, polyamide).</p> <p>Restricted disperse dyes are suspected of causing allergic reactions and are prohibited from use for dyeing of textiles.</p>	DIN 54231:2005
2475-46-9	C.I. Disperse Blue 3			
3179-90-6	C.I. Disperse Blue 7			
3860-63-7	C.I. Disperse Blue 26			
12222-75-2	C.I. Disperse Blue 35			
12222-97-8	C.I. Disperse Blue 102			
12223-01-7	C.I. Disperse Blue 106			
61951-51-7	C.I. Disperse Blue 124			
23355-64-8	C.I. Disperse Brown 1			
2581-69-3	C.I. Disperse Orange 1			
730-40-5	C.I. Disperse Orange 3			
82-28-0	C.I. Disperse Orange 11			
12223-33-5	C.I. Disperse Orange 37/76/59			
13301-61-6				
51811-42-8				
85136-74-9	C.I. Disperse Orange 149			
2872-52-8	C.I. Disperse Red 1			
2872-48-2	C.I. Disperse Red 11			
3179-89-3	C.I. Disperse Red 17			
61968-47-6	C.I. Disperse Red 151			
119-15-3	C.I. Disperse Yellow 1			
2832-40-8	C.I. Disperse Yellow 3			
6300-37-4	C.I. Disperse Yellow 7			
6373-73-5	C.I. Disperse Yellow 9			
6250-23-3	C.I. Disperse Yellow 23			
12236-29-2	C.I. Disperse Yellow 39			
54824-37-2	C.I. Disperse Yellow 49			

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Textile Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement
	Dyes, Forbidden and Disperse, continued			
54077-16-6	C.I. Disperse Yellow 56	75 ppm each	Disperse dyes are a class of water-insoluble dyes that penetrate the fibre system of synthetic or manufactured fibres and are held in place by physical forces without forming chemical bonds. Disperse dyes are used in synthetic fibre (e.g., polyester, acetate, polyamide). Restricted disperse dyes are suspected of causing allergic reactions and are prohibited from use for dyeing of textiles.	DIN 54231:2005
3761-53-3	C.I. Acid Red 26			
569-61-9	C.I. Basic Red 9			
569-64-2	C.I. Basic Green 4			
2437-29-8				
10309-95-2				
548-62-9	C.I. Basic Violet 3			
632-99-5	C.I. Basic Violet 14			
2580-56-5	C.I. Basic Blue 26			
1937-37-7	C.I. Direct Black 38			
2602-46-2	C.I. Direct Blue 6			
573-58-0	C.I. Direct Red 28			
16071-86-6	C.I. Direct Brown 95			
60-11-7	4-Dimethylaminoazobenzene (Solvent Yellow 2)			
6786-83-0	C.I. Solvent Blue 4			
561-41-1	4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol			
	Dyes, Navy Blue			
118685-33-9	Component 1: C ₃₉ H ₂₃ ClCrN ₇ O ₁₂ S ₂ Na	75 ppm each	Navy blue colourants are regulated and are prohibited from use for dyeing of textiles. (Index 611-070-00-2)	DIN 54231:2005
Not allocated	Component 2: C ₄₆ H ₃₀ CrN ₁₀ O ₂₀ S ₂ ·3Na			

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Textile Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement
	Flame Retardants			
126-72-7	Tris(2,3,-dibromopropyl) phosphate (TRIS)	Total: 5 ppm	Flame-retardant chemicals are rarely used to meet flammability requirements in children's clothing and adult products. They should no longer be used in apparel and footwear.	Methanol extraction, GC/MS
545-55-1	Tris(1-aziridinyl)phosphine oxide (TEPA)			LC-MS
32534-81-9	Pentabromodiphenyl ether (PentaBDE)			Acetonitril extraction, LC-DAD-MS, and confirmation with GC/MS
32536-52-0	Octabromodiphenyl ether (OctaBDE)			
1163-19-5	Decabromodiphenyl ether (DecaBDE)			Methanol extraction, GC/MS
79-94-7	Tetrabromobisphenol A (TBBP A)			
115-96-8	Tris(2-chloroethyl)phosphate (TCEP)			
59536-65-1	Polybromobiphenyls (PBB)			
5412-25-9	Bis(2,3-dibromopropyl) phosphate (BDBPP)			
3194-55-6	Hexabromocyclododecane (HBCDD)			
3296-90-0	2,2-bis(bromomethyl)-1,3-propanediol (BBMP)			
13674-87-8	Tris(1,3-dichloro-isopropyl) phosphate (TDCPP)			
25155-23-1	Trixylyl phosphate (TXP)			
	Fluorinated Greenhouse Gases			
Various	See Regulation (EC) No 842/2006 for a complete list.	0.1 ppm each		Sample preparation: Purge and trap — thermal desorption or SPME Measurement: GC/MS
	Formaldehyde			
50-00-0	Formaldehyde	Adults and children: 75 ppm Babies: 16 ppm	Used in textiles as an anti-creasing and anti-shrinking agent. It is also often used in polymeric resins.	Textile: JIS L 1041-1983 A (Japan Law 112) or EN ISO 14184-1:2011 Leather: ISO 17226-1:2008 with ISO 17226-2:2008 confirmation method in case of interferences

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Textile Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement
	Heavy Metals			
7440-36-0	Antimony (Sb)	Extractable: 30 ppm	Found in or used as a catalyst in polymerisation of polyester, flame retardants, fixing agents, pigments and alloys.	Sample preparation: EN ISO 105-E04:2013 Measurement: EN ISO 17294-2:2014
7440-38-2	Arsenic (As)	Extractable: 0.2 ppm Total: 100 ppm	Arsenic and its compounds can be used in preservatives, pesticides and defoliants for cotton, synthetic fibres, paints, inks, trims and plastics.	Sample preparation: Extractable: Textiles: EN ISO 105-E04:2013 Leather: DIN EN ISO 17072-1:2014 Total: Microwave digestion with H ₂ O ₂ /HNO ₃ Measurement: EN ISO 17294-2 :2014
7440-39-3	Barium (Ba)	Extractable: 1000 ppm	Barium and its compounds can be used in pigments for inks, plastics, surface coatings, as well as in dyeing, mordants, filler in plastics, textile finishes, and leather tanning.	Sample preparation: Extractable: Textiles: EN ISO 105-E04:2013 Leather: DIN EN ISO 17072-1:2014 Measurement: EN ISO 17294-2 :2014
7440-43-9	Cadmium (Cd)	Extractable: 0.1 ppm Total: Adults: 75 ppm Children and babies: 40 ppm	Cadmium compounds are used as pigments (especially in red, orange, yellow and green); as a stabilizer for PVC; and in fertilizers, biocides and paints. The total limit for all will be reduced to 40 ppm in a future update.	Sample preparation: Extractable: Textiles: EN ISO 105-E04:2013 Leather: DIN EN ISO 17072-1:2014 Total: Microwave digestion with H ₂ O ₂ /HNO ₃ Measurement: EN ISO 17294-2:2014
7440-47-3	Chromium (Cr)	Extractable for textiles: 1 ppm Leather footwear for babies: 60 ppm	Chromium compounds can be used as dyeing additives, dye-fixing agents, colour fastness after-treatments, dyes for wool, silk and polyamide (especially dark shades) and leather tanning.	Sample preparation: EN ISO 105-E04:2013 Measurement: EN ISO 17294-2:2014

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Textile Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement
	Heavy Metals, continued			
18540-29-9	Chromium VI	Extractable: Leather: 3 ppm Knitted textiles for babies: 0.5 ppm	Though typically associated with leather tanning, Chromium VI also may be used in the dyeing of wool (after the chroming process).	Sample preparation: Textile: EN ISO 105-E04:2013 Leather ageing: Conditions for leather ageing: 24 hours, 80 degrees C, maximum 5% relative humidity, no ventilation; EN 17075-1:2015 Measurement: Textile: EN ISO 17294-2 Leather: EN 17075-1:2015 Ageing test is used at brand discretion.
7440-48-4	Cobalt (Co)	Extractable: 1 ppm	Cobalt and its compounds can be used in alloys, pigments, dyestuff, and the production of plastic buttons.	Sample preparation: EN ISO 105-E04:2013 Measurement: EN ISO 17294-2
7440-50-8	Copper (Cu)	Extractable: 25 ppm	Copper and its compounds can be found in alloys and pigments, and in textiles as an antimicrobial agent.	Sample preparation: EN ISO 105-E04:2013 Measurement: EN ISO 17294-2:2014
7439-92-1	Lead (Pb)	Extractable: Adults and children: 1 ppm Babies: 0.2 ppm Total: 90 ppm	May be associated with plastics, paints, inks, pigments and surface coatings.	Sample preparation: Extractable: EN ISO 105-E04:2013 Total: Microwave digestion with H2O2/HNO3 Lead in paint and surface coating: CPSIA Section 101 16 CFR 1303 Measurement: EN ISO 17294-2:2014
7439-97-6	Mercury (Hg)	Extractable: 0.02 ppm Total: 0.5 ppm	Mercury compounds can be present in pesticides and as contaminants in caustic soda (NaOH). They may also be used in paints.	Sample preparation: Extractable: EN ISO 105-E04:2013 Total: Microwave digestion with H2O2/HNO3 Measurement: EN ISO 17294-2:2014
7440-02-0	Nickel (Ni)	Extractable: 1 ppm Release: Prolonged skin contact: 0.5 µg/cm ² /week Pierced part: 0.2 µg/cm ² /week	Nickel and its compounds can be used for plating alloys and improving corrosion-resistance and hardness of alloys. They can also occur as impurities in pigments and alloys.	Sample preparation: Textile: EN ISO 105-E04:2013 Metal parts: EN 12472:2005+ A1:2009 Measurement: Textile: EN ISO 17294-2:2014 Metal parts: EN 1811:2015

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Textile Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement
	Heavy Metals, continued			
7782-49-2	Selenium (Se)	Extractable: 500 ppm	May be found in synthetic fibres, paints, inks, plastics and metal trims.	Sample preparation: EN ISO 105-E04:2013 Measurement: EN ISO 17294-2:2014
	Monomers			
100-42-5	Styrene	500 ppm	Styrene is a precursor for polymerization and may be present in various styrene-copolymers like plastic buttons.	120 degrees C for one hour headspace solvent extraction GC-MS; Methanol extraction at 60 degrees C
	N-Nitrosamines			
62-75-9	N-nitrosodimethylamine (NDMA)	0.5 ppm each	Can be formed as by-product in the production of rubber.	GB/T 24153-2009: determination using GC/MS or LC/MS/MS
55-18-5	N-nitrosodiethylamine (NDEA)			
621-64-7	N-nitrosodipropylamine (NDPA)			
924-16-3	N-nitrosodibutylamine (NDBA)			
100-75-4	N-nitrosopiperidine (NPIP)			
930-55-2	N-nitrosopyrrolidine (NPYR)			
59-89-2	N-nitrosomorpholine (NMOR)			
614-00-6	N-nitroso N-methyl N-phenylamine (NMPPhA)			
612-64-6	N-nitroso N-ethyl N-phenylamine (NEPhA)			
	Organotin Compounds			
Various	Dibutyltin (DBT)	1 ppm each	Class of chemicals combining tin and organics such as butyl and phenyl groups. Organotins are predominantly found in the environment as antifoulants in marine paints, but they can also be used as biocides (e.g., antibacterials), catalysts in plastic and glue production, and heat stabilizers in plastics/rubber. In textiles and apparel, organotins are associated with plastics/rubber, inks, paints, metallic glitter, polyurethane products and heat transfer material.	CEN ISO/TS 16179: 2012
Various	Diocetyl tin (DOT)			
Various	Monobutyltin (MBT)			
Various	Tributyltin (TBT)	0.5 ppm each		
Various	Triphenyltin (TPhT)			
Various	All tri-substituted Organotin compounds	1 ppm each		

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Textile Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement
	Ortho-phenylphenol			
90-43-7	Ortho-phenylphenol (OPP)	1000 ppm	OPP can be used for its preservative properties in leather or as a carrier in dyeing processes.	Sample Preparation: §64 BVL B 82.02.08 Measurement: GC-MS, LC-MS for confirmation
	Ozone-depleting Substances			
Various	See Regulation (EC) No 1005/2009 for a complete list.		Ozone-depleting substances are prohibited from use.	GC/MS headspace 120 degrees C for 45 minutes
	Perfluorinated and Polyfluorinated Chemicals (PFCs)			
2795-39-3	Perfluorooctane Sulfonate (PFOS)	1 µg/m ² each	PFOA and PFOS may be present as unintended byproducts in long-chain commercial water, oil and stain repellent agents. PFOA may also be used in polymers like polytetrafluoroethylene (PTFE)	CEN/TS 15968:2014
3825-26-1	Perfluorooctanoic Acid (PFOA) and its salts and esters			
	Pesticides, Agricultural			
Various	See Appendix A for a complete list.	0.5 ppm each	May be found in natural fibres, primarily cotton.	ISO 15913/DIN 38407 F2 or EPA 8081/EPA 8151A or BVL L 00.00-34:2010-09

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Textile Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement
	Phthalates			
28553-12-0	Di-Iso-nonylphthalate (DINP)	500 ppm each Total: 1000 ppm	<p>Esters of ortho-phthalic acid (phthalates) are a class of organic compound commonly added to plastics to increase flexibility. They are sometimes used to facilitate the moulding of plastic by decreasing its melting temperature.</p> <p>Phthalates can be found in:</p> <ul style="list-style-type: none"> • Flexible plastic components (e.g., PVC) • Print pastes • Adhesives • Plastic buttons • Plastic sleeveings • Polymeric coatings <p>The listed phthalates are those most commonly used across industry sectors. Find more information about phthalates restricted by legislation in the REACH SVHC list, which is updated frequently.</p>	<p>Sample preparation: CPSC-CH-C1001-09.3</p> <p>Measurement: Textile: GC-MS, EN ISO 14389:2014 Leather: GC-MS</p>
117-84-0	Di-n-octylphthalate (DNOP)			
117-81-7	Di(2-ethylhexyl)-phthalate (DEHP)			
26761-40-0	Diisodecylphthalate (DIDP)			
85-68-7	Butylbenzylphthalate (BBP)			
84-74-2	Dibutylphthalate (DBP)			
84-69-5	Diisobutylphthalate (DIBP)			
68515-42-4	Di(C7-C11 alkyl) phthalate (DHNUP), linear + branched			
71888-89-6	Di(C6-C8 alkyl) phthalate (DIHP), branched, C7 rich			
117-82-8	Di(2-methoxyethyl) phthalate (DMEP)			
84-75-3	Di-n-hexylphthalate (DnHP)			
84-66-2	Diethylphthalate (DEP)			
605-50-5	Diisopentylphthalate (DIPP)			
776297-69-9	n-Pentylisopentylphthalate (NPIPP)			
131-18-0	Di-n-pentylphthalate (DPP)			
68515-50-4	Dihexylphthalate, branched + linear			
131-11-3	Dimethylphthalate (DMP)			
84777-06-0	1,2-Benzenedicarboxylic acid, dipentylester, branched + linear			

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Textile Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement
Polycyclic Aromatic Hydrocarbons (PAHs)				
83-32-9	Acenaphthene	No individual restriction	Total: 10 ppm	AFPS GS 2014
208-96-8	Acenaphthylene			
120-12-7	Anthracene			
191-24-2	Benzo(g,h,i)perylene			
86-73-7	Fluorene			
206-44-0	Fluoranthene			
193-39-5	Indeno(1,2,3-cd)pyrene			
91-20-3	Naphthalene**			
85-01-8	Phenanthrene			
129-00-0	Pyrene	1 ppm each Child care articles: 0.5 ppm each		
56-55-3	Benzo(a)anthracene			
50-32-8	Benzo(a)pyrene			
205-99-2	Benzo(b)fluoranthene			
192-97-2	Benzo[e]pyrene			
205-82-3	Benzo[j]fluoranthene			
207-08-9	Benzo(k)fluoranthene			
218-01-9	Chrysene			
53-70-3	Dibenzo(a,h)anthracene			

PAHs are natural components of crude oil and are common residues from oil refining. PAHs have a characteristic smell similar to that of car tires or asphalt. Oil residues containing PAHs are added to rubber and plastics as a softener or extender and may be found in rubber, plastics, lacquers and coatings. PAHs are often found in the outsoles of footwear and in printing pastes for screen prints. PAHs can be present as impurities in Carbon Black. They also may be formed from thermal decomposition of recycled materials during reprocessing

**Naphthalene: Dispersing agents for textile dyes may contain high residual naphthalene concentrations due to the use of low-quality naphthalene derivatives (e.g., poor-quality naphthalene sulphonate formaldehyde condensation products).

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Textile Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement
Volatile Organic Compounds (VOCs)				
71-43-2	Benzene	5 ppm	<p>These VOCs should not be used in textile auxiliary chemical preparations. They are also associated with solvent-based processes such as solvent-based polyurethane coatings and glues/adhesives. They should not be used for any kind of facility cleaning or spot cleaning.</p>	<p>For general VOC screening: GC/MS headspace 45 minutes at 120 degrees C For DMAC: DIN CEN ISO/TS 16189:2013</p>
56-23-5	Carbon tetrachloride	Total: 1000 ppm		
67-66-3	Chloroform			
107-06-2	1,2-Dichloroethane			
75-35-4	1,1-Dichloroethylene			
127-19-5	Dimethylacetamide (DMAC)			
76-01-7	Pentachloroethane			
630-20-6	1,1,1,2- Tetrachloroethane			
79-34-5	1,1,1,2- Tetrachloroethane			
127-18-4	Tetrachloroethylene (PER)			
108-88-3	Toluene			
71-55-6	1,1,1- Trichloroethane			
79-00-5	1,1,2- Trichloroethane			
79-01-6	Trichloroethylene			
1330-20-7	Xylenes (meta-, ortho-, para-)			

Appendix A: Pesticides, Agricultural

CAS No.	Pesticide Name	CAS No.	Pesticide Name	CAS No.	Pesticide Name
93-72-1	2-(2,4,5-trichlorophenoxy) propionic acid, its salts and compounds	115-32-2	Dicofol	319-86-8	g-Hexachlorocyclohexane with and without Lindane
		141-66-2	Dicrotophos		
93-76-5	2,4,5-T	60-57-1	Dieldrine	118-74-1	Hexachlorobenzene
93-72-1	2,4,5-TP	60-51-5	Dimethoate	465-73-6	Isodrine
94-75-7	2,4-D	88-85-7	Dinoseb, its salts and acetate	4234-79-1	Kelevane
309-00-2	Aldrine	57648-21-2	DTTB (Timiperone)	143-50-0	Kepone
86-50-0	Azinophosmethyl	115-29-7	Endosulfan	7784-40-9	Lead hydrogen arsenate
2642-71-9	Azinophosethyl	959-98-8	Endosulfan I (alpha)	58-89-9	Lindane
4824-78-6	Bromophos-ethyl	33213-65-9	Endosulfan II (beta)	121-75-5	Malathione
2425-06-1	Captafol	72-20-8	Endrine	94-74-6	MCPA
63-25-2	Carbaryl	66230-04-4	Esfenvalerate	94-81-5	MCPB
510-15-6	Chlorbenzilat	106-93-4	Ethylendibromid	93-65-2	Mecoprop
57-74-9	Chlordane	56-38-2	Ethylparathione	10265-92-6	Metamidophos
6164-98-3	Chlordimeform	51630-58-1	Fenvalerate	72-43-5	Methoxychlor
470-90-6	Chlorfenvinphos	1336-36-3	Halogenated biphenyls, including Polychlorinatedbiphenyl (PCB)	2385-85-5	Mirex
1897-45-6	Chlorthalonil	53469-21-9		6923-22-4	Monocrotophos
56-72-4	Coumaphos	Various		56-38-2	Parathion
68359-37-5	Cyfluthrin	Various	Halogenated terphenols, including polychlorinated terphenyl (PCT)	298-00-0	Parathion-methyl
91465-08-6	Cyhalothrin			608-90-2	Pentabromobenzene
52315-07-8	Cypermethrin	Various	Halogenated naphthalenes, including polychlorinated naphthalenes (PCNs)	1825-21-4	Pentachloroanisole
78-48-8	S,S,S-Tributyl phosphorotrithioate (Tribufos)			52645-53-1	Permethrine
52918-63-5	Deltamethrin	Various	Halogenated diarylalkanes	7786-34-7	Phosdrin/Mevinphos
53-19-0	DDD	99688-47-8	Halogenated diphenyl methanes, including Monomethyl-dibromo-diphenyl methane, Monomethyl-dichloro-diphenyl methane, and Monomethyl-tetrachloro-diphenyl methane	72-56-0	Perthane
72-54-8		81161-70-8		31218-83-4	Propethamphos
3424-82-6	DDE	76253-60-6		41198-08-7	Profenophos
72-55-9		76-44-8	13593-03-8	Quinalphos	
50-29-3	DDT	1024-57-3	Heptachloroepoxide	82-68-8	Quintozene
789-02-6		36355-01-8	Hexabromobiphenyl	8001-50-1	Strobane
333-41-5	Diazinone	319-84-6	a-Hexachlorocyclohexane with and without Lindane	297-78-9	Telodrine
1085-98-9	Dichlofluanide			8001-35-2	Toxaphene
120-36-5	Dichloroprop	319-85-7	b-Hexachlorocyclohexane with and without Lindane	731-27-1	Tolyfluanide
				1582-09-8	Trifluraline



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