HUGO BOSS

V 11.0

RESTRICTED SUBSTANCES LIST & PRODUCT COMPLIANCE GUIDELINE

Status:	Released
Valid from:	Season W23PF
Valid for:	Apparel, Footwear, Accessories, Jewelry, and Packaging
Created by:	Team Product Compliance & Environment
Released by:	Team Lead Product Compliance & Environment of Global Corporate Responsibility & Public Affairs

TABLE OF CONTENTS

LEGEND / ABBREVIATIONS

AFIRM	The AFIRM Group (Apparel and Footwear International RSL Management Working Group) is a voluntary association of brands who have the aim to reduce the use and impact of harmful substances in the apparel and footwear supply chain. Therefore, the group developed a Restricted Substances List and a Toolkit to reach the aim. The HUGO BOSS Restricted Substances List & Product Compliance is based on the AFIRM RSL.
CADS	Cooperation at DSI (Deutsches Schuhinstitut)
CAS	Chemical-Abstract-Service; Unique numerical identifiers for chemical elements, compounds, polymers, biological sequences, mixtures and alloys
CEN	Comité Européen de Normalisation
CFR	Code of Federal Regulations (USA)
C.I.	Color Index; Compendium of dyes: In the U.K. the color Index was prepared by the Society of Dyers and Colourists, while in the USA it is done by American Association of Textile Chemists and Colorists.
DIN	Deutsches Institut für Normung
EN	European Norm
EPA	(US) Environmental Protection Agency
ISO	International Organization for Standardization
ISO/TS	International Organization for Standardization/Technical Specification
mg/kg	milligram per kilogram
MI	Material Information
ppb	parts per billion
ppm	parts per million
prEN	Draft European Norm
PRSL	Packaging Restricted Substances List
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
Reporting limit	Values equal or higher than this limit have to be documented in the test report
RSL	Restricted Substances List
SVHC	Substances of Very High Concern
Usage ban	Substance must not be used intentionally in any production of the product
W23PF	Season: Winter 2023 Pre-Fall
w/o	without
µg/cm^2	microgram per square centimeter
µg/cm^2/week	microgram per square centimeter per week
*	An asterisk next to a chemical or class of chemicals in the RSL and PRSL indicates that an information sheet is available on the AFIRM website; simply click on the chemical name, and your web browser will load a PDF of the information sheet for that substance or group of substances.

RESTRICTED SUBSTANCES FOR PRODUCTS (RSL)

CAS No.	Substance	Limits Raw Material & Finished Product		Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
*	ACETOPHENONE AND 2-PHENYL-2-PROPANOL			- corresponding to AFIRM		
98-86-2	Acetophenone	50 ppm each		Potential breakdown products in EVA foam when using dicumyl peroxide as a crosslinking agent.	Extraction in acetone or methanol GC/MS, sonication for 30 minutes at 60°C	25 ppm each
617-94-7	2-Phenyl-2-Propanol					
*	ALKYLPHENOLS (APs) AND ALKYLPHENOLETHOXYLATES (APEOs), including all isomers			- corresponding to AFIRM, and additional APEOs information given		
Various	Nonylphenol (NP), mixed isomers	Total APs: 10 ppm	Total APs + APEOs: 100 ppm (only for down and knitted wool garments)	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. APs are used as intermediaries in the manufacture of APEOs and antioxidants used to protect or stabilize polymers. Biodegradation of APEOs into APs is the main source of APs in the environment. APEOs and formulations containing APEOs are prohibited from use throughout supply chain and manufacturing processes. Recycled content: please refer to the test matrix for testing recommendation for recycled materials.	Textiles and leather: EN ISO 21084:2019 Polymers and all other materials: 1 g sample/20 ml THF, sonication for 60 minutes at 70°C analysis according to EN ISO 21084:2019	3 ppm sum of NP & OP
Various	Octylphenol (OP), mixed isomers					
Various	Nonylphenol ethoxylates (NPEOs)	Total APEOs: 100 ppm			All materials except leather: EN ISO 18254-1:2016, determination of APEO using LC/MS or LC/MS/MS Leather: Sample preparation and analysis using EN ISO 18218-1:2015[1] with quantification based on EN ISO 18254-1:2016	20 ppm sum of NPEO & OPEO
Various	Octylphenol ethoxylates (OPEOs)					

[1] To ensure the reproducibility of test results, only the EN ISO 18218-1:2015 shall be applied for analysis.

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
*	AZO-AMINES AND ARYLAMINE SALTS		- corresponding to AFIRM		
92-67-1	4-Aminobiphenyl	20 ppm each	Azo dyes and pigments are colorants 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 of textiles.	All materials except leather: EN ISO 14362-1:2017 Leather: EN ISO 17234-1:2015 <u>p-Aminoazobenzene</u>: All materials except leather: EN ISO 14362-3:2017 Leather: EN ISO 17234-2:2011	5 ppm each
92-87-5	Benzidine				
95-69-2	4-Chlor-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-Toluylendiamine				
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				
3165-93-3	4-chloro-o-toluidinium chloride				
553-00-4	2-Naphthylammoniumacetate				
39156-41-7	4-methoxy-m-phenylene diammonium sulphate				
21436-97-5	2,4,5-trimethylaniline hydrochloride				

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
*	BISPHENOLS	- corresponding to AFIRM except BPA, tested in leather only for information.			
80-05-7	Bisphenol-A (BPA)	All materials: 1 ppm Leather: For informational purposes only.	Used in the production of epoxy resins, polycarbonate plastics, flame retardants , PVC, polyamide dye-fixing agents, and sulfone- and phenol-based leather tanning agents. May be found in recycled polymeric and paper materials due to polycarbonate plastic and thermal receipt paper made with bisphenols entering waste streams. BPA is formally restricted in items intended to come in contact with the mouth. AFIRM is currently investigating all relevant sources of bisphenols and their concentrations in products with legislation imposing strict limits pending in multiple jurisdictions. Restriction of these substances is likely in a future update.	All materials: Extraction: 1 g sample/20 ml THF, sonication for 60 minutes at 60°C, analysis with LC/MS	0.1 ppm
80-09-1	Bisphenol S (BPS)	For informational purposes only. AFIRM recommends testing synthetic textiles & blends, polycarbonate plastics, and natural leather.			1 ppm each
620-92-8	Bisphenol F (BPF)				
1478-61-1	Bisphenol AF (BPAF)				
*	CHLORINATED PARAFFINS	- corresponding to AFIRM			
85535-84-8	Short-chain chlorinated Paraffins (SCCP) (C10-C13)	1000 ppm	May be used as softeners, flame retardants or as fat liquoring agents in leather production. Also used as plasticizer in polymer production.	Textiles: ISO 22818:2021 (SCCP + MCCP) Leather: ISO 18219-1:2021 (SCCP) ISO 18219-2:2021 (MCCP)	100 ppm
85535-85-9	Medium-chain chlorinated Paraffins (MCCP) (C14-C17)	1000 ppm			100 ppm
*	CHLOROPHENOLS	- corresponding to AFIRM			
15950-66-0	2,3,4-Trichlorophenol (TriCP)	0.5 ppm each	Chlorophenols are polychlorinated compounds used as preservatives or pesticides. Pentachlorophenol (PCP), tetrachlorophenol (TeCP), and trichlorophenols (TriCP) are sometimes used to prevent mold and kill insects when growing cotton and when storing/transporting fabrics. PCP, TeCP and TriCP can also be used as in-can preservatives in print pastes and other chemical mixtures.	All materials: DIN 50009:2021	0.5 ppm each
933-78-8	2,3,5-Trichlorophenol (TriCP)				
933-75-5	2,3,6-Trichlorophenol (TriCP)				
95-95-4	2,4,5-Trichlorophenol (TriCP)				
88-06-2	2,4,6-Trichlorophenol (TriCP)				
609-19-8	3,4,5-Trichlorophenol (TriCP)				
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) and its salts and esters				

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
*	CHLORINATED BENZENES AND TOLUENES		- corresponding to AFIRM except 1,2-Dichlorobenzene which limit is lower.		
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 fibers. They can also be used as solvents. Cross-contamination from anti-moth agents and poly shipping bags may cause failures.	All materials: EN 17137-2018	0.2 ppm each
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	2,3,4,6-Tetraclorotoluene				
1006-31-1	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				
5216-25-1	P-Chlorobenzotrichloride				
98-07-7	Benzotrichloride				
100-44-7	Benzyl Chloride[2]				
95-50-1	1,2-Dichlorobenzene				

[2] GC-MS with confirmatory LC-MS in the event of a positive detection to avoid false-positive results.

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
*	DIMETHYLFUMARATE	- corresponding to AFIRM			
624-49-7	Dimethylfumarate (DMFu)	0.1 ppm	DMFu is an anti-mold agent that may be used in sachets in packaging to prevent the build-up of mold, especially during shipping.	All materials: ISO 16186:2021	0.05 ppm
*	DYES, FORBIDDEN AND DISPERSE	- corresponding to AFIRM			
2475-45-8	C.I. Disperse Blue 1	30 ppm each	Disperse dyes are a class of water-insoluble dyes that penetrate the fiber system of synthetic or manufactured fibers and are held in place by physical forces without forming chemical bonds. Disperse dyes are used in synthetic fiber (e.g. polyester, acetate, polyamide). Restricted disperse dyes are suspected of causing allergic reactions or of being carcinogenic and are prohibited from use for dyeing of textiles.	All materials: DIN 54231:2005	15 ppm each
2475-46-9	C.I. Disperse Blue 3				
3179-90-6	C.I. Disperse Blue 7				
3860-63-7	C.I. Disperse Blue 26				
56524-77-7	C.I. Disperse Blue 35A				
56524-76-6	C.I. Disperse Blue 35B				
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 / 13301-61-6 / 51811-42-8	C.I. Disperse Orange 37/76/59				
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				

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
	DYES, FORBIDDEN AND DISPERSE, continued		- corresponding to AFIRM		
54824-37-2	C.I. Disperse Yellow 49	30 ppm each	Disperse dyes are a class of water-insoluble dyes that penetrate the fiber system of synthetic or manufactured fibers and are held in place by physical forces without forming chemical bonds. Disperse dyes are used in synthetic fiber (e.g. polyester, acetate, polyamide). Restricted disperse dyes are suspected of causing allergic reactions or of being carcinogenic and are prohibited from use for dyeing of textiles.	All materials: DIN 54231:2005	15 ppm each
54077-16-6	C.I. Disperse Yellow 56				
3761-53-3	C.I. Acid Red 26				
569-61-9	C.I. Basic Red 9				
569-64-2 / 2437-29-8 / 10309-95-2	C.I. Basic Green 4				
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	- corresponding to AFIRM			
118685-33-9	Component 1: $C_{39}H_{23}ClCrN_7O_{12}S{\cdot}2Na$	30 ppm each	Navy blue colorants are regulated and are prohibited from use for dyeing of textiles. (Index 611-070-00-2)	All materials: DIN 54231:2005	15 ppm each
Not allocated	Component 2: $C_{46}H_{30}CrN_{10}O_{20}S_2{\cdot}3Na$				

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
*	FLAME-RETARDANTS	- corresponding to AFIRM			
84852-53-9	Decabromodiphenyl ethane (DBDPE)	10 ppm each	With very limited exceptions, flame-retardant chemicals, including the entire class of organohalogen flame retardants, should no longer be applied to materials during production, even if used for other applications e.g. plasticizers. Listed here are examples of flame-retardant substances used historically across the apparel and footwear industry. It is not intended to be a complete list. Other flame retardants not applicable to this industry are regulated worldwide by the Stockholm Convention and the Aarhus Protocol, which have been implemented in the European Union under the POPs Regulation.	All materials: EN ISO 17881-1:2016	5 ppm each
32534-81-9	Pentabromodiphenyl ether (PentaBDE)				
32536-52-0	Octabromodiphenyl ether (OctaBDE)				
1163-19-5	Decabromodiphenyl ether (DecaBDE)				
various	All other Polybrominated diphenyl ether (PBDE)				
79-94-7	Tetrabromobisphenol A (TBBP A)				
59536-65-1	Polybromobiphenyls (PBB)				
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)			All materials: EN ISO 17881-2:2016	5 ppm each
25155-23-1	Trixylyl phosphate (TXP)				
126-72-7	Tris(2,3,-dibromopropyl) phosphate (TRIS)				
545-55-1	Tris(1-aziridinyl)phosphine oxide) (TEPA)				
115-96-8	Tris(2-chloroethyl)phosphate (TCEP)				
5412-25-9	Bis(2,3-dibromopropyl) phosphate (BDBPP)				
*	FLUORINATED GREENHOUSE GASES	- corresponding to AFIRM			
Various	See Regulation (EC) No 517/2014 for a complete list: https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32014R0517	0.1 ppm each	Prohibited from use. May be used as foam blowing agents, solvents, fire retardants, and aerosol propellants.	Sample preparation: Purge and trap — thermal desorption or SPME Measurement: GC/MS	0.1 ppm each
*	FORMALDEHYDE	- corresponding to AFIRM			
50-00-0	Formaldehyde	Adults and children: 75 ppm Babies: 16 ppm	Used in textiles as an anti-creasing and anti-shrinking agent, often also in polymeric resins. Although very rare in apparel & footwear, composite wood materials, e.g. particle board and plywood, must comply with existing California forthcoming US formaldehyde emission requirements (40 CFR 770). Suppliers are advised to refer to brand-specific requirements for these materials.	All materials except leather: JIS L 1041-2011 A (Japan Law 112) or EN ISO 14184-1:2011 Leather: EN ISO 17226-2:2019 with EN ISO 17226-1:2021 confirmation method in case of interferences. Alternatively, EN ISO 17226-1:2021 can be used on its own.	16 ppm

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
*	HEAVY METALS (Non-Jewelry)	- corresponding to AFIRM, except Cr VI reporting limit			
7440-36-0	Antimony (Sb)	Extractable: 30 ppm	Found in or used as a catalyst in polymerization of polyester, flame retardants, fixing agents, pigments and alloys.	All materials except leather: DIN EN 16711-2:2016 Leather: DIN EN ISO 17072-1:2019	Extractable: 3 ppm
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 fibers, paints, inks, trims and plastics.	Extractable: All materials except leather: DIN EN 16711-2:2016 Leather: DIN EN ISO 17072-1:2019 Total: All materials except leather: DIN EN 16711-1:2016 Leather: DIN EN ISO 17072-2:2019	Extractable: 0.1 ppm Total: 10 ppm
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, mordant, filler in plastics, textile finish and leather tanning.	All materials except leather: DIN EN 16711-2:2016 Leather: DIN EN ISO 17072-1:2019	Extractable: 100 ppm
7440-43-9	Cadmium (Cd)	Extractable: 0.1 ppm Total: 40 ppm	Cadmium compounds may be used as pigments (especially in red, orange, yellow and green); as a stabilizer for PVC; and in fertilizers, biocides and paints.	Extractable: All materials except leather: DIN EN 16711-2:2016 Leather: DIN EN ISO 17072-1:2019 Total: All materials except leather: DIN EN 16711-1:2016 Leather: DIN EN ISO 17072-2:2019	Extractable: 0.05 ppm Total: 5 ppm
7440-47-3	Chromium (Cr)	Extractable: Textiles only: Adults and children: 2 ppm Babies: 1 ppm	Chromium compounds can be used as dyeing additives, dye-fixing agents, color fastness after-treatments, dyes for wool, silk and polyamide (especially dark shades) and leather tanning.	All materials except leather: DIN EN 16711-2:2016 Leather: EN ISO 17072-1:2019	Extractable: 0.5 ppm
18540-29-9*	Chromium VI (Cr VI)	Extractable: Leather: 3 ppm Textiles: 1 ppm	Though typically associated with leather tanning, Chromium VI also may be used in the "after-chroming" process for wool dyeing (Chrome salts applied to acid-dyed wool to improve fastness).	All materials except leather: DIN EN 16711-2:2016 with EN ISO 17075-1:2017 if Cr is detected. Leather: EN ISO 17075-1:2017 and EN ISO 17075-2:2017 for confirmation in case the extract causes interference. Alternatively, EN ISO 17075-2:2017 may be used on its own. Ageing test: ISO 10195:2018. Method A2 is used at brand discretion.	Extractable: Leather: 2 ppm Textiles: 0.5 ppm

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
	HEAVY METALS (non Jewelry), continued		- corresponding to AFIRM, except Cr VI reporting limit		
7440-48-4	Cobalt (Co)	Extractable: Adults: 4 ppm Children and babies: 1 ppm	Cobalt and its compounds can be used in alloys, pigments, dyestuff and the production of plastic buttons.	All materials except leather: DIN EN 16711-2:2016 Leather: DIN EN ISO 17072-1:2019	0.5 ppm
7440-50-8	Copper (Cu)	Extractable: Adults: 50 ppm Children and babies: 25 ppm	Copper and its compounds can be found in alloys and pigments and in textiles as an antimicrobial agent. Copper is exempt from restriction limit in metal parts.	All materials except leather: DIN EN 16711-2:2016 Leather: DIN EN ISO 17072-1:2019	5 ppm
7439-92-1	Lead (Pb)	Extractable: Adults: 1 ppm Children and Babies: 0.2 ppm Total: 90 ppm	May be associated with alloys, plastics, paints, inks, pigments, surface coatings and metal components. Crystal or "lead glass" is exempt from total Lead restrictions.	Extractable: All materials except leather: DIN EN 16711-2:2016 Leather: DIN EN ISO 17072-1:2019 Total: Non-metal: CPSC-CH-E1002-08.3 Metal: CPSC-CH-E1001-08.3 Paint and surface coating: CPSC-CH-E1003-09.1	Extractable: 0.2 ppm Total: 10 ppm
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 could also occur in paints and as catalysts in the manufacture of PU and vinyl chloride for use in PVC.	Extractable: All materials except leather: DIN EN 16711-2:2016 Leather: DIN EN ISO 17072-1:2019 Total: All materials except leather: DIN EN 16711-1:2016 Leather: DIN EN ISO 17072-2:2019	Extractable: 0.02 ppm Total: 0.1 ppm
7440-02-0 *	Nickel (Ni)	Extractable: 1 ppm Release (metal parts): Prolonged skin contact: 0.5 µg/cm²/week Eyewear frames: 0.5 µg/cm²/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.	Extractable: All materials except leather: DIN EN 16711-2:2016 Leather: DIN EN ISO 17072-1:2019 Release (metal parts): EN 12472:2020 and EN 1811:2011+A1:2015 Release (Eyewear Frames): EN16128:2015	Extractable: 0.1 ppm Release: 0.5 µg/cm² /week
7782-49-2	Selenium (Se)	Extractable: 500 ppm	May be found in synthetic fibers, paints, inks, plastics and metal trims.	All materials except leather: DIN EN 16711-2:2016 Leather: DIN EN ISO 17072-1:2019	Extractable: 50 ppm

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
	HEAVY METALS (Jewelry)	- corresponding to AFIRM			
7440-36-0	Antimony (Sb)	Paints & Coatings: Extractable: 60 ppm	Found in or used as a catalyst in polymerization of polyester, flame retardants, fixing agents, pigments and alloys.	ASTM F2923:2020[3]	Extractable: 5 ppm
7440-38-2	Arsenic (As)	Paints & Coatings: Extractable: 25 ppm	Arsenic and its compounds can be used in preservatives, pesticides and defoliants for cotton, synthetic fibers, paints, inks, trims and plastics.	ASTM F2923: 2020[3]	Extractable: 5 ppm
7440-39-3	Barium (Ba)	Paints & Coatings: Extractable: 1000 ppm	Barium and its compounds can be used in pigments for inks, plastics, surface coatings, as well as in dyeing, mordant, filler in plastics, textile finish and leather tanning.	ASTM F2923: 2020[3]	Extractable: 100 ppm
7440-43-9	Cadmium (Cd)	Substrates, Paints & Coatings: Total: Adults: 75 ppm Children: 40 ppm	Cadmium compounds may be used as pigments (especially in red, orange, yellow and green); as a stabilizer for PVC; and in fertilizers, biocides and paints.	ASTM F2923: 2020[3]	Extractable: 5 ppm Total: 5 ppm
7440-47-3	Chromium (Cr)	Paints & Coatings: Extractable: 60 ppm	Chromium compounds can be used as dyeing additives, dye-fixing agents, color fastness after-treatments, dyes for wool, silk and polyamide (especially dark shades) and leather tanning.	ASTM F2923: 2020[3]	Extractable: 5 ppm
7439-92-1	Lead (Pb)	Substrates, Paints & Coatings: Total: 90 ppm	May be associated with alloys, plastics, paints, inks, pigments, surface coatings and metal components.	ASTM F2923: 2020[3]	Total: 10 ppm
7439-97-6	Mercury (Hg)	Paints & Coatings: Extractable: 60 ppm	Mercury compounds can be present in pesticides and as contaminants in caustic soda (NaOH). They could also occur in paints and in gold due to its use during the extraction process.	ASTM F2923:2020[3]	Extractable: 5 ppm
7440-02-0 *	Nickel (Ni)	Release (metal parts): Prolonged skin contact 0.5 µg/cm²/week Pierced part: 0.2 µg/cm²/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.	EN 12472:2020 and EN 1811:2011[3]+A1:2015[3]	Release: Prolonged skin contact: 0.5 µg/cm²/week Pierced part: 0.2 µg/cm²/week
7782-49-2	Selenium (Se)	Paints & Coatings: Extractable: 500 ppm	May be found in synthetic fibers, paints, inks, plastics and metal trims.	ASTM F2923:2020[3]	Extractable: 50 ppm

[3] Check ASTM Standard for each metal's relevant test method. Sample preparation: Wax areas not intended for skin-contact: EN 1811:2011+A1:2015.

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
*	MONOMERS	- corresponding to AFIRM			
100-42-5	Styrene, free	500 ppm	Styrene is a precursor for polymerization and may be present in various styrene-copolymers like plastic buttons. Free styrene is restricted, not total styrene.	Extraction in Methanol GC/MS, sonication for 60 minutes at 60°C	50 ppm
75-01-4	Vinyl Chloride	1 ppm	Vinyl Chloride is a precursor for polymerization and may be present in various PVC material like prints, coatings, flip flops and synthetic leather.	EN ISO 6401:2008	1 ppm
*	N-NITROSAMINES	- corresponding to AFIRM			
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/MC with LC/MS/MS verification if positive. Alternatively, LC/MS/MS may be performed on its own. EN 19577:2019	0.5 ppm each
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 (NMPhA)				
612-64-6	N-nitroso N-ethyl N-phenylamine (NEPhA)				
*	ORGANOTIN COMPOUNDS	- corresponding to AFIRM			
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.	All materials: CEN ISO/TS 16179:2012 or EN ISO 22744-1:2020	0.1 ppm each
Various	Dioctyltin (DOT)				
Various	Monobutyltin (MBT)				
Various	Tricyclohexyltin (TCyHT)				
Various	Trimethyltin (TMT)				
Various	Trioctyltin (TOT)				
Various	Tripropyltin (TPT)				
Various	Tributyltin (TBT)	0.5 ppm each			
Various	Triphenyltin (TPhT)				
*	ORTHO-PHENYLPHENOL	- corresponding to AFIRM			
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.	All materials: DIN 50009:2021	100 ppm

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
*	OZONE-DEPLETING SUBSTANCES	- corresponding to AFIRM			
Various	See Regulation (EC) No 1005/2009 for a complete list: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:286:0001:0030:EN:PDF	5 ppm	Prohibited from use. Ozone-depleting substances have been used as a foaming agent in PU foams as well as a dry-cleaning agent.	All materials: GC/MS headspace 120 °C for 45 minutes	5 ppm
*	PERFLUORINATED AND POLYFLUORINATED CHEMICALS (Regulated PFCs, or per- and polyfluoroalkyl substances, PFAS)	- limits corresponding to AFIRM, except the limit of PFOS for coated leather			
	Perfluorooctane Sulfonate (PFOS) and related substances		PFOA and PFOS may be present as unintended byproducts in long-chain and short-chain commercial water, oil and stain repellent agents. PFOA may also be used in polymers like polytetrafluoroethylene (PTFE). In addition to this list, all PFOA- and PFOS-related substances are prohibited from use and are regulated worldwide by the Stockholm Convention and the Aarhus Protocol, which have been implemented in the European Union under the POPs Regulation. More information about the ban of PFC/PFAS is shown in the chapter "**Phased-out substances**".	All materials: EN ISO 23702-1	1 µg/m² (100 ppm each if coated leather as per definition from Directive 94/11/EC)
1763-23-1	Perfluorooctanesulfonate (PFOS)	1 µg/m² total (1000 ppm each if coated leather as per definition from Directive 94/11/EC)			
2795-39-3	Perfluorooctanesulfonic acid, potassium salt (PFOS-K)				
29457-72-5	Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)				
29081-56-9	Perfluorooctanesulfonic acid, ammonium salt (PFOS-NH_4)				
70225-14-8	Perfluorooctane sulfonate, diethanolamine salt (PFOS-$NH(OH)_2$)				
56773-42-3	Perfluorooctanesulfonic acid, tetraethylammonium salt (PFOS-$N(C_2H_5)_4$)				
4151-50-2	N-Ethylperfluoro-1-octanesulfonamide (N-Et-FOSA)				
31506-32-8	N-Methylperfluoro-1-octanesulfonamide (N-Me-FSOA)				
1691-99-2	2-(N-Ethylperfluoro-1-octanesulfonamido)-ethanol (N-Et-FOSE)				
24448-09-7	2-(N-Methylperfluoro-1-octanesulfonamido)-ethanol (N-Me-FOSE)				
307-35-7	Perfluoro-1-octanesulfonyl fluoride (POSF)				
754-91-6	Perfluorooctane sulfonamide (PFOSA)				

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
	PERFLUORINATED AND POLYFLUORINATED CHEMICALS (Regulated PFCs , or per- and polyfluoroalkyl substances, PFAS), continued		**- limits corresponding to AFIRM**		
	Perfluorooctanoic Acid (PFOA) and its salts		PFOA and PFOS may be present as unintended by-products in long-chain and short-chain commercial water, oil and stain repellent agents. PFOA may also be used in polymers like polytetrafluoroethylene (PTFE). In addition to this list, all PFOA- and PFOS-related substances are prohibited from use and are regulated worldwide by the Stockholm Convention and the Aarhus Protocol, which have been implemented in the European Union under the POPs Regulation. More information about the ban of PFC is shown in the chapter "**Phased-out substances**".	All materials: EN ISO 23702-1	
335-67-1	Perfluorooctanoic Acid (PFOA)	25 ppb total			25 ppb total
335-95-5	Sodium perfluorooctanoate (PFOA-Na)				
2395-00-8	Potassium perfluorooctanoate (PFOA-K)				
335-93-3	Silver perfluorooctanoate (PFOA-Ag)				
335-66-0	Perfluorooctanoyl fluoride (PFOA-F)				
3825-26-1	Ammonium pentadecafluorooctanoate (APFO)				
	PFOA-related substances				
39108-34-4	1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	1000 ppb total			1000 ppb total
376-27-2	Methyl perfluorooctanoate (Me-PFOA)				
3108-24-5	Ethyl perfluorooctanoate (Et-PFOA)				
678-39-7	2-Perfluorooctylethanol (8:2 FTOH)				
27905-45-9	1H,1H,2H,2H-Perfluorodecyl acrylate (8:2 FTA)				
1996-88-9	1H,1H,2H,2H-Perfluorodecyl methacrylate (8:2 FTMA)				
*	**PESTICIDES/ HERBICIDES, AGRICULTURAL**		**- corresponding to AFIRM**		
93-72-1	2-(2,4,5-trichlorophenoxy) propionic acid, its salts and compounds; 2,4,5-TP	0.5 ppm each	May be found in natural fibers (primarily cotton).	All materials: ISO 15913 / DIN 38407 F2 or EPA 8081 / EPA 8151A or BVL L 00.00-34:2010-09	0.5 ppm each
93-76-5	2,4,5-trichlorophenoxyacetic acid, its salts and compounds; 2,4,5-T				
94-75-7	2,4-dichlorophenoxy-acetic acid, its salts and compounds; 2,4-D				
309-00-2	Aldrine				
86-50-0	Azinophosmethyl				
2642-71-9	Azinophosethyl				
4824-78-6	Bromophos-ethyl				
2425-06-1	Captafol				
63-25-2	Carbaryl				
510-15-6	Chlorbenzilat				

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
	PESTICIDES/ HERBICIDES, AGRICULTURAL, continued		- corresponding to AFIRM		
57-74-9	Chlordane	0.5 ppm each	May be found in natural fibers (primarily cotton)	All materials: ISO 15913 / DIN 38407 F2 or EPA 8081 / EPA 8151A or BVL L 00.00-34:2010-09	0.5 ppm each
6164-98-3	Chlordimeform				
470-90-6	Chlorfenvinphos				
1897-45-6	Chlorthalonil				
56-72-4	Coumaphos				
68359-37-5	Cyfluthrin				
91465-08-6	Cyhalothrin				
52315-07-8	Cypermethrin				
78-48-8	S,S,S-Tributyl phosphorotrithioate (Tribufos)				
52918-63-5	Deltamethrin				
53-19-0	o,p-Dichlorodiphenyl-dichloroethane (o,p-DDD)				
72-54-8	p,p-Dichlorodiphenyl-dichloroethane (p,p-DDD)				
3424-82-6	o,p-Dichlorodiphenyl-dichloroethylene (o,p-DDE)				
72-55-9	p,p-Dichlorodiphenyl-dichloroethylene (p,p-DDE)				
789-02-6	o,p-Dichlorodiphenyl-trichloroethane (o,p-DDT)				
50-29-3	p,p-Dichlorodiphenyl-trichloroethane (p,p-DDT)				
333-41-5	Diazinone				
1085-98-9	Dichlofluanide				
120-36-5	Dichloroprop				
115-32-2	Dicofol				
141-66-2	Dicrotophos				
60-57-1	Dieldrine				
60-51-5	Dimethoate				
88-85-7	Dinoseb, its salts and acetate				
63405-99-2	DTTB (4,6-Dichloro-7 (2,4,5-trichloro-phenoxy) -2-Trifluoro methyl benz imidazole)				
115-29-7	Endosulfan				
959-98-8	Endosulfan I (alpha)				
33213-65-9	Endosulfan II (beta)				

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
	PESTICIDES/ HERBICIDES, AGRICULTURAL, continued		- corresponding to AFIRM		
72-20-8	Endrine	0.5 ppm each	May be found in natural fibers (primarily cotton)	All materials: ISO 15913 / DIN 38407 F2 or EPA 8081 / EPA 8151A or BVL L 00.00-34:2010-09	0.5 ppm each
66230-04-4	Esfenvalerate				
106-93-4	Ethylenedibromid				
56-38-2	Ethylparathione; Parathion				
51630-58-1	Fenvalerate				
1336-36-3	Halogenated biphenyls, including Polychlorinatedbiphenyl (PCB)				
Various	Halogenated naphthalenes, including polychlorinated naphthalenes (PCNs)				
76-44-8	Heptachlor				
1024-57-3	Heptachloroepoxide				
319-84-6	a-Hexachlorocyclohexane with and without Lindane				
319-85-7	b-Hexachlorocyclohexane with and without Lindane				
319-86-8	g-Hexachlorocyclohexane with and without Lindane				
118-74-1	Hexachlorobenzene				
465-73-6	Isodrine				
4234-79-1	Kelevane				
143-50-0	Kepone				
58-89-9	Lindane				
121-75-5	Malathione				
94-74-6	MCPA				
94-81-5	MCPB				
93-65-2	Mecoprop				
10265-92-6	Metamidophos				
72-43-5	Methoxychlor				
2385-85-5	Mirex				
6923-22-4	Monocrotophos				

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
	PESTICIDES/ HERBICIDES, AGRICULTURAL, continued	- corresponding to AFIRM			
298-00-0	Parathion-methyl	0.5 ppm each	May be found in natural fibers (primarily cotton)	All materials: ISO 15913 / DIN 38407 F2 or EPA 8081 / EPA 8151A or BVL L 00.00-34:2010-09	0.5 ppm each
1825-21-4	Pentachloroanisole				
7786-34-7	Phosdrin/Mevinphos				
72-56-0	Perthane				
31218-83-4	Propethamphos				
41198-08-7	Profenophos				
13593-03-8	Quinalphos				
82-68-8	Quintozene				
8001-50-1	Strobane				
297-78-9	Telodrine				
8001-35-2	Toxaphene				
731-27-1	Tolylfluanide				
1582-09-8	Trifluarline				
*	PHTHALATES	- corresponding to AFIRM			
28553-12-0	Di-Iso-nonylphthalate (DINP)	500 ppm each Total: 1000 ppm (all 24 phthalates)	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 molding of plastic by decreasing its melting temperature. Phthalates can be found in: Flexible plastic components (e.g., PVC) Print pastes Adhesives Plastic buttons Plastic sleevings Polymeric coatings The REACH substances of very high concern (SVHC) candidate list is updated frequently. Suppliers should assume that this RSL includes all Phthalates on the SVHC list — whether itemized here or not.	Sample preparation for all materials: CPSC-CH-C1001-09.4 Measurement: Textile: GC-MS, EN ISO 14389:2014 (7.1 Calculation based on weight of print only; 7.2 Calculation based on weight of print and textile if print cannot be removed). All materials except textiles: GC-MS	50 ppm each
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)				
84-75-3	Di-n-hexylphthalate (DnHP)				
84-66-2	Diethylphthalate (DEP)				
131-11-3	Dimethylphthalate (DMP)				
131-18-0	di-n-pentyl phthalate (DPENP)				
84-61-7	dicyclohexyl phthalate (DCHP)				
71888-89-6	1,2-benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich				
117-82-8	Bis(2-methoxyethyl) phthalate				

CAS No.	Substance	Limits Raw Material & Finished Product		Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
	PHTHALATES, continued	- corresponding to AFIRM				
605-50-5	Diisopentyl phthalate (DIPP)	500 ppm each Total: 1000 ppm (all 24 phthalates)		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 molding of plastic by decreasing its melting temperature. Phthalates can be found in: Flexible plastic components (e.g., PVC); Print pastes Adhesives Plastic button Plastic sleevings Polymeric coatings The REACH substances of very high concern (SVHC) candidate list is updated frequently. Suppliers should assume that this RSL includes all Phthalates on the SVHC list — whether itemized here or not.	Sample preparation for all materials: CPSC-CH-C1001-09.4 Measurement: Textile: GC-MS, EN ISO 14389:2014 (7.1 Calculation based on weight of print only; 7.2 Calculation based on weight of print and textile if print cannot be removed). All materials except textiles: GC-MS	50 ppm each
131-16-8	Dipropyl phthalate (DPRP)					
27554-26-3	Diisooctyl phthalate (DIOP)					
68515-50-4	1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear					
71850-09-4	Diisohexyl phthalate (DIHxP)					
68515-42-4	1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)					
84777-06-0	1,2-benzenedicarboxylic acid Dipentyl ester, branched and linear					
68648-93-1	1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters or mixed decyl and hexyl and octyl diesters with ≥ 0.3% of dihexyl phthalate; 1,2-Benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters; 1,2-Benzenedicarboxylic acid, di-C6-10-alkyl esters					
68515-51-5						
776297-69-9	n-pentyl-isopentylphthalate (nPIPP)					
*	POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)		- corresponding to AFIRM			
83-32-9	Acenaphthene	No individual restriction	Total: 10 ppm (all 18 PAHs)	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).	All materials: AFPS GS 2019	0.2 ppm each
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					

CAS No.	Substance	Limits Raw Material & Finished Product		Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
	POLYCYCLIC AROMATIC HYDROCARBONS (PAHs), continued			- corresponding to AFIRM		
56-55-3	Benzo(a)anthracene	1 ppm each Childcare articles: 0.5 ppm each	Total: 10 ppm (all 18 PAHs)	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).	All materials: AFPS GS 2019	0.2 ppm each
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					
*	QUINOLINE	- corresponding to AFIRM				
91-22-5	Quinoline	50 ppm		Found as an impurity in polyester and some dyestuffs. Quinoline can be included with disperse dye testing as the same method is used for both.	All materials: DIN 54231:2005 with methanol extraction at 70 °C	10 ppm
*	SOLVENTS (RESIDUAL)	- corresponding to AFIRM				
68-12-2	Dimethylformamide (DMFa)	500 ppm		Solvent used in plastics, rubber, and polyurethane (PU) coating. Water-based PU does not contain DMFa and is therefore preferable.	Textiles: EN 17131:2019 All other materials: DIN CEN ISO/TS 16189:2013	50 ppm each
75-12-7	Formamide	1000 ppm each		Byproduct in the production of EVA foams used in products such as baby mats.		
127-19-5	Dimethylacetamide (DMAC)			Solvent used in the production of elastane fibers and sometimes as substitute for DMFa.		
872-50-4	N-Methyl-2-pyrrolidone (NMP)			Industrial solvent utilized in production of water-based polyurethanes and other polymeric materials. May also be used for surface treatment of textiles, resins, and metal coated plastics or as a paint stripper.		

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
*	UV ABSORBERS / STABILIZERS		- corresponding to AFIRM		
3846-71-7	UV 320	1000 ppm each	PU foam materials such as open cell foams for padding. Used as UV-absorbers for plastics (PVC, PET, PC, PA, ABS, and other polymers), rubber, polyurethane.	DIN EN 62321-6:2016-05 (Extraction in THF, analysis by GC/MS)	100 ppm each
3864-99-1	UV 327				
25973-55-1	UV 328				
36437-37-3	UV 350				
2440-22-4	Drometrizole	For informational purposes only. AFIRM recommends testing to assess content levels.	Used as UV-absorbers for plastics (PVC, PET, PC, PA, ABS, and other polymers), rubber, polyurethane.		
*	VOLATILE ORGANIC COMPOUNDS (VOCs)		- corresponding to AFIRM		
71-43-2	Benzene	5 ppm	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.	For general VOC screening: GC/MS headspace 45 minutes at 120 °C.	5 ppm
75-15-0	Carbon Disulfide	Total: 1000 ppm			20 ppm each
56-23-5	Carbon tetrachloride				
67-66-3	Chloroform				
108-94-1	Cyclohexanone				
71-55-6	1,1,1- Trichloroethane				
107-06-2	1,2-Dichloroethane				
75-35-4	1,1-Dichloroethylene				
100-41-4	Ethylbenzene				
76-01-7	Pentachloroethane				
630-20-6	1,1,1,2- Tetrachloroethane				
79-34-5	1,1,2,2- Tetrachloroethane				
127-18-4	Tetrachloroethylene (PER)				
108-88-3	Toluene				
79-00-5	1,1,2- Trichloroethane				
79-01-6	Trichloroethylene				
1330-20-7	Xylenes (meta-, ortho-, para-)				
108-38-3					
95-47-6					
106-42-3					

RESTRICTED SUBSTANCES FOR PACKAGING (PRSL)

CAS No.	Substance	Limits Component Materials	Potential Uses Processing for Packaging Material	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
*	ALKYLPHENOLS (APs) AND ALKYLPHENOL ETHOXYLATES (APEOs), including all isomers		- corresponding to AFIRM		
Various	Nonylphenol (NP), mixed isomers	Total: 100 ppm	APEOS are used as surfactants in the production of plastics, elastomers, paper, and textiles. These chemicals can be found in many processes involving foaming, emulsification, solubilization, or dispersion. APEOs can be used in paper pulping, lubrication oils, and plastic polymer stabilization. APs are used as intermediaries in the manufacture of APEOs and antioxidants used to protect or stabilize polymers. Biodegradation of APEOs into APs is the main source of APs in the environment. 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.	Textiles and Leather: EN ISO 21084:2019 with determination of LC/MS or LC/MS/MS Polymers and all other materials: 1 g sample/20 mL THF, sonication for 60 minutes at 70 °C, analysis according to EN ISO 21084:2019	10 ppm sum of NP & OP
Various	Octylphenol (OP), mixed isomers				
Various	Nonylphenol ethoxylates (NPEOs)	Total: 100 ppm		All materials except Leather: EN ISO 18254-1:2016, determination of APEO using LC/MS or LC/MS/MS Leather: EN ISO 18218-1:2015	20 ppm sum of NPEO & OPEO
Various	Octylphenol ethoxylates (OPEOs)				
*	AZO-AMINES AND ARYLAMINE SALTS		- corresponding to AFIRM		
92-67-1	4-Aminobiphenyl	20 ppm each	Azo dyes and pigments are colorants 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.	All materials except Leather: EN ISO 14362-1:2017 Leather: EN ISO 17234-1:2015 p-Aminoazobenzene: All materials except Leather: EN ISO 14362-3:2017 Leather: EN ISO 17234-2:2011	5 ppm each
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				

CAS No.	Substance	Limits Component Materials	Potential Uses Processing for Packaging Material	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
	AZO-AMINES AND ARYLAMINE SALTS, continued		- corresponding to AFIRM		
119-93-7	3,3'-Dimethylbenzidine	20 ppm each	Azo dyes and pigments are colorants 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.	All materials except Leather: EN ISO 14362-1:2017 Leather: EN ISO 17234-1:2015 p-Aminoazobenzene: All materials except Leather: EN ISO 14362-3:2017 Leather: EN ISO 17234-2:2011	5 ppm each
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-Toluylendiamine				
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				
3165-93-3	4-Chloro-o-toluidinium chloride				
553-00-4	2-Naphthylammoniumacetate				
39156-41-7	4-Methoxy-m-phenylene diammonium sulphate				
21436-97-5	2,4,5-Trimethylaniline hydrochloride				
*	BISPHENOLS		- corresponding to AFIRM		
80-05-7	Bisphenol-A (BPA)	All materials: 1 ppm Leather: For informational purposes only.	Used in the production of epoxy resins, polycarbonate plastics, flame retardants, PVC, polyamide dye-fixing agents, and sulfone- and phenol-based leather tanning agents. May be found in recycled polymeric and paper materials due to polycarbonate plastic and thermal receipt paper made with bisphenols entering waste streams. BPA is formally prohibited from use in receipt paper. AFIRM is currently investigating all relevant sources of bisphenols and their concentrations in products and packaging with legislation imposing strict limits pending in multiple jurisdictions. Restriction of these substances is likely in a future update.	All materials: Extraction: 1 g sample/20 ml THF, sonication for 60 minutes at 60 °C, analysis with LC/MS	0.1 ppm
80-09-1	Bisphenol-S (BPS)	AFIRM recommends testing synthetic textiles & blends, polycarbonate plastics, and natural leather to assess concentrations of bisphenols in preparation for restriction in the future.			1 ppm each
620-92-8	Bisphenol-F (BPF)				
1478-61-1	Bisphenol-AF (BPAF)				

CAS No.	Substance	Limits Component Materials	Potential Uses Processing for Packaging Material	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
*	BUTYLATED HYDROXYTOLUENE (BHT)		- corresponding to AFIRM		
128-37-0	Dibutylhydroxytoluene (BHT)	25 ppm	Used as an additive in plastics as an antioxidant to prevent aging. Can cause phenolic yellowing of textiles.	All materials: ASTM D4275	5 ppm
*	DIMETHYLFUMARATE		- corresponding to AFIRM		
624-49-7	Dimethylfumarate (DMFu)	0.1 ppm	DMFu is an anti-mold agent used in sachets in packaging to prevent the build-up of mold, especially during shipping.	All materials: ISO 16186:2021	0.05 ppm
*	FORMALDEHYDE		- corresponding to AFIRM		
50-00-0	Formaldehyde	150 ppm	Formaldehyde can be found in polymeric resins, binders, and fixing agents for dyes and pigments, including those with fluorescent effects. It is also used as a catalyst in certain printing, adhesives, and heat transfers. Formaldehyde can be used in antimicrobial applications for odor control. Formaldehyde found in packaging can off-gas directly onto product. Composite wood materials (e.g., particle board and plywood) must comply with California and U.S. formaldehyde emission requirements (40 CFR 770). Though formaldehyde legislation does not specifically apply to packaging, suppliers are advised to refer to brand-specific requirements for these materials.	Wood: EN 717-3 Paper: EN 645 and EN 1541 Textiles; Finishing, Dyes, Inks & Coatings: JIS L 1041-2011 A (Japan Law 112) or EN ISO 14184-1:2011 Leather: EN ISO 17226-2:2019 with EN ISO 17226-1:2021 confirmation method in case of interferences. Alternatively, EN ISO 17226-1:2021 can be used on its own.	16 ppm
*	HEAVY METALS (Total Content)		- corresponding to AFIRM		
7440-43-9	Cadmium (Cd)	100 ppm (Sum of 4 HM)	Cadmium compounds are used as pigments (especially in red, orange, yellow and green) and in paints. It can also be used as a stabilizer for PVC.	All materials: Total heavy metals (Cd, Cr, Pb & Hg): EN ISO 16711-1:2016 If total of four heavy metals exceeds 100 ppm and Cr contributes to the sum, test for Cr VI.	5 ppm
7439-92-1	Lead (Pb)		May be associated with plastics, paints, inks, pigments, and surface coatings.		10 ppm
7439-97-6	Mercury (Hg)		Mercury compounds can be present in pesticides and as contaminants in caustic soda (NaOH). They may also be used in paints.		5 ppm

CAS No.	Substance	Limits Component Materials	Potential Uses Processing for Packaging Material	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
	HEAVY METALS (Total Content), continued		- corresponding to AFIRM		
18540-29-9*	Chromium VI (Cr VI)	100 ppm (Sum of 4 HM)	Though typically associated with leather tanning, Chromium VI also may be used in pigments, chrome plating of metals, and wood preservatives.	Metal: IEC 62321-7-1:2015. The testing laboratory will convert the test result into ppm. Natural Leather and Natural Materials: EN ISO 17075-1:2017 and EN ISO 17075-2:2017 for confirmation in case the extract causes interference. Alternatively, EN ISO 17075-2:2017 may be used on its own. All other materials: IEC 62321-7-2:2015	3 ppm
*	ORGANOTIN COMPOUNDS		- corresponding to AFIRM		
Various	Dibutyltin (DBT)	1 ppm each	Class of chemicals combining tin and organics such as butyl and phenyl groups. 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 packaging, organotins are associated with plastics/rubber, inks, paints, metallic glitter, polyurethane products and heat transfer material.	All materials: CEN ISO/TS 16179:2012 or EN ISO 22744-1:2020	0.1 ppm each
Various	Dioctyltin (DOT)				
Various	Monobutyltin (MBT)				
Various	Tricyclohexyltin (TCyHT)				
Various	Trimethyltin (TMT)				
Various	Trioctyltin (TOT)				
Various	Tripropyltin (TPT)				
Various	Tributyltin (TBT)	0.5 ppm each			
Various	Triphenyltin (TPhT)				
*	PERFLUORINATED AND POLYFLUORINATED CHEMICIALS (Regulated PFCs, or per- and polyfluoroalkyl substances, PFAS)		- corresponding to AFIRM		
	Perfluorooctane Sulfonate (PFOS) and related substances		PFOA and PFOS may be present as unintended byproducts in long-chain and short-chain commercial water, oil and stain repellent agents. PFOA may also be used in polymers like polytetrafluoroethylene (PTFE). In addition to this list, all PFOA related substances are prohibited from use. More information about the ban of PFC is shown in the chapter "**Phased-out substances**".	All materials: EN ISO 23702-1	1 µg/m² each
1763-23-1	Perfluorooctanesulfonate (PFOS)	1 µg/m² total			
2795-39-3	Perfluorooctanesulfonic acid, potassium salt (PFOS-K)				
29457-72-5	Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)				
29081-56-9	Perfluorooctanesulfonic acid, ammonium salt ($PFOS-NH_4$)				
70225-14-8	Perfluorooctane sulfonate, diethanolamine salt ($PFOS-NH(OH)_2$)				

CAS No.	Substance	Limits Component Materials	Potential Uses Processing for Packaging Material	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
	PERFLUORINATED AND POLYFLUORINATED CHEMICIALS (Regulated PFCs, or per- and polyfluoroalkyl substances, PFAS), continued - corresponding to AFIRM				
	Perfluorooctane Sulfonate (PFOS) and related substances, continued		PFOA and PFOS may be present as unintended byproducts in long-chain and short-chain commercial water, oil and stain repellent agents. PFOA may also be used in polymers like polytetrafluoroethylene (PTFE). In addition to this list, all PFOA related substances are prohibited from use. More information about the ban of PFC is shown in the chapter "**Phased-out substances**".	All materials: EN ISO 23702-1	1 µg/m² each
56773-42-3	Perfluorooctanesulfonic acid, tetraethylammonium salt (PFOS-N(C_2H_5)$_4$)	1 µg/m² total			
4151-50-2	N-Ethylperfluoro-1-octanesulfonamide (N-Et-FSOA)				
31506-32-8	N-Methylperfluoro-1-octanesulfonamide (N-Me-FOSA)				
1691-99-2	2-(N-Ethylperfluoro-1-octanesulfonamido)-ethanol (N-Et-FOSE)				
24448-09-7	2-(N-Methylperfluoro-1-octanesulfonamido)-ethanol (N-Me-FOSE)				
307-35-7	Perfluoro-1-octanesulfonyl fluoride (POSF)				
754-91-6	Perfluorooctane sulfonamide (PFOSA)				
	Perfluorooctanoic Acid (PFOA) and its salts				25 ppb total
335-67-1	Perfluorooctanoic Acid (PFOA)	25 ppb total			
335-95-5	Sodium perfluorooctanoate (PFOA-Na)				
2395-00-8	Potassium perfluorooctanoate (PFOA-K)				
335-93-3	Silver perfluorooctanoate (PFOA-Ag)				
335-66-0	Perfluorooctanoyl fluoride (PFOA-F)				
3825-26-1	Ammonium pentadecafluorooctanoate (APFO)				
	PFOA-related substances				1000 ppb total
39108-34-4	1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	1000 ppb total			
376-27-2	Methyl perfluorooctanoate (Me-PFOA)				
3108-24-5	Ethyl perfluorooctanoate (Et-PFOA)				
678-39-7	2-Perfluorooctylethanol (8:2 FTOH)				
27905-45-9	1H,1H,2H,2H-Perfluorodecyl acrylate (8:2 FTA)				
1996-88-9	1H,1H,2H,2H-Perfluorodecyl methacrylate (8:2 FTMA)				

CAS No.	Substance	Limits Component Materials	Potential Uses Processing for Packaging Material	Suitable Test Method Sample Preparation & Measurement	Reporting Limit
*	PHTHALATES		- corresponding to AFIRM		
28553-12-0	Di-Iso-nonylphthalate (DINP)	500 ppm each Total: 1000 ppm	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. Phthalates can be found in: Flexible plastic components (e.g., PVC) Print pastes Adhesives Plastic buttons Plastic sleeves Polymeric coatings This list includes all Phthalates on the REACH substances of very high concern (SVHC) candidate list, whether listed here or not, as the SVHC list is updated frequently.	All materials: CPSC-CH-C1001-09.4, analysis by GC/MS	50 ppm each
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)				
84-75-3	Di-n-hexylphthalate (DnHP)				
84-66-2	Diethylphthalate (DEP)				
131-11-3	Dimethylphthalate (DMP)				
131-18-0	di-n-pentyl phthalate (DPENP)				
84-61-7	Dicyclohexyl phthalate (DCHP)				
71888-89-6	1,2-benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich				
117-82-8	Bis(2-methoxyethyl) phthalate				
605-50-5	Diisopentyl phthalate (DIPP)				
131-16-8	Dipropyl phthalate (DPRP)				
27554-26-3	Diisooctyl phthalate (DIOP)				
68515-50-4	1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear				
71850-09-4	Diisohexyl phthalate (DIHxP)				
68515-42-4	1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)				
84777-06-0	1,2-benzenedicarboxylic acid Dipentyl ester, branched and linear				
68648-93-1 68515-51-5	1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters or mixed decyl and hexyl and octyl diesters with ≥ 0.3% of dihexyl phthalate; 1,2-Benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters; 1,2-Benzenedicarboxylic acid, di-C6-10-alkyl esters				
776297-69-9	n-pentyl-isopentylphthalate (nPIPP)				