G-STAR RAW

RESTRICTED SUBSTANCES LIST FOR GARMENTS

NOVEMBER 2016 - VERSION 1.4

INTRODUCTION

G-Star is committed to producing high quality and ethically manufactured products and intends to only do business with suppliers that share our commitment to make a strong product in a socially and environmentally conscious way. We outlined the minimum Social and Environmental, Health & Safety (EHS) standards under which our products should be manufactured in the G-Star Supplier Code of Conduct. The Code of Conduct refers to the G-Star Restricted Substances List (RSL) as the basis for monitoring the use of chemicals in G-Star products.

The RSL applies to all products of G-Star Raw C.V. and/or its subsidiaries (hereinafter 'G-Star'), which includes ready-made garments, non-apparel, accessories and packing materials. The RSL also applies to all materials, such as metal parts and trims for use in producing G-Star products.

Zero Discharge of Hazardous Chemicals (ZDHC) by 2020

Next to preventing the use of hazardous chemicals in our products, G-Star is also committed to eliminating industrial releases of hazardous chemicals into the environment. We therefore set the target to reach zero discharge of hazardous chemicals from all our products and production processes by 2020.

With regards to limits set used for input chemicals and formulations, please refer to G-Star's Manufacturing Restricted Substance List (MRSL). The document addresses hazardous substances potentially used and discharged into the environment during manufacturing and related processes, not just those which could be present in finished products.

Purpose of the RSL

Our suppliers are critical partners in meeting our commitments regarding consumer safety, working conditions and environmental protection. The purpose of the RSL for garment and fabric manufacturing is to inform our suppliers on all chemicals that are banned or restricted in G-Star finished products. Our suppliers are expected to study this document carefully and communicate the information to relevant internal teams, sub-contractors and others involved in the production of G-Star products.

Each supplier is required to declare and ensure that the materials, parts, trims, metal parts and other goods supplied or otherwise delivered for G-Star products comply with the limitations described or referred to in the RSL and any additional requirements imposed by law or local authorities. The supplier is also responsible for seeking guidance from G-Star in situations of doubt about product compliance with the RSL for garment and fabric manufacturing.

Compliance with this Restricted Substance List is a mandatory condition for each and every order placed by G-Star.

G-Star Raw C.V. November 2016

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METHODOLOGY

This Restricted Substances List (RSL) is intended to inform on worldwide regulations restricting or banning the use of chemicals in textile production and apparel products including packaging materials and accessories attached to garments.

G-Star is a system partner of bluesign technologies ag. This is an independent standard that guarantees that products are free of hazardous chemicals.

We are committed to implement their bluesign® standard in our supply chain to come to a healthy, safe and environmentally friendly production process. Therefore G-Star has alligned their RSL to the bluesign® criteria for consumer safety limits.

By joining bluesign technologies ag we encourage our suppliers in our entire textile production chain, from raw materials to textile manufacturers, to also become a system partner of bluesign technologies ag.

DEFINITIONS

Article

An object which during production is given a special shape, surface or design, which determines its function to a greater degree than does its chemical composition (fibers, textile fabrics, buttons, zippers, etc.).

CAS Number

CAS registry numbers are unique numerical identifiers for chemical elements, compounds, polymers, biological sequences, mixtures and alloys. Chemical Abstracts Service (CAS), a division of the American Chemical Society, assigns these identifiers to every chemical that has been described in the literature. The intention is to make database searches more convenient, as chemicals often have many names. Almost all molecule databases today allow searching by CAS number.

Chemical Substance

A chemical element and its compounds with constant composition and properties. It is defined by the CAS number.

G-Star Restricted Limit

Document at hand defines consumer safety limits for chemical substances in articles.

The intentional use of these chemical substances along the manufacturing chain – starting from producing auxiliaries and dyestuffs – is not prohibited. Substances may occur also in chemical products as a non-intentional residue. Nevertheless consumer safety limits must be kept at any time.

Usage Ban

For several chemical substances or substance groups a usage ban is defined. For these substances or substance groups intentional use in manufacturing of articles is prohibited. That means that chemical products (e.g. colorants or textile auxiliaries) used for manufacturing of articles must not intentionally contain these substances or substance groups.

The aim of a usage ban is to avoid release of harmful substances to the environment and to avoid occurrence in the manufactured article by precautionary principle.

RESTRICTED SUBSTANCES LIST 1.4

Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
ALDEHYDES					
Formaldehyde	50-00-0		Textile: ISO 14184-1 (2011) Leather: ISO 17226-1 (2008) or ISO 17226-2 (2008)"	A: worn next to skin: <75 mg/kg B: indirect skin contact: <300 mg/kg	Formaldehyde can be released from and is contained as impurity in anti-creasing, anti-shrinking, easy-ironing and water repellence finishing. Formaldehyde is a toxic chemical which can induce irritation to eyes and nose and even cause cancer.
ALKYLPHENOLS (AP) AND ALKYPHENOL ETHOXYLATES (APEO)					
Nonylphenols (NP)	25154-52-3 104-40-5 11066-49-2 84852-15-3	Zero Discharge	Textile: ISO 18254-1 (2016) Leather: ISO 18218-1 (2015)	Usage ban 2013 onwards APEO/NPEO traces < 100 mg/kg* *Sources of contamination has to be identified and phased out. APEO/NPEO trace <500mg/kg for recycled material	APEOs can be used as or found in: Detergents, Scouring agents, Wetting agents, Softeners, Emulsifier/dispersing agents for dyes and prints, Impregnating agents, Degreasing agents for leather, Leather Finishing, De-gumming for silk production, Dyes and pigment preparations, Polyester padding and Down/feather fillings. APEOs degrade only partially during waste water treatment, reverting to the more toxic AP (alkylphenol)/OP (octylphenol) and particularly NP (nonylphenol). NP is very persistent in the environment and does not degrade readily, very toxic to aquatic organisms and described as endocrine disrupter.
Octylphenols (OP)	27193-28-8 140-66-9 1806-26-4				
Nonylphenolethoxylates (NPEO)	9016-45-9 26027-38-3 37205-87-1 68412-54-4 127087-87-0				
Octylphenolethoxylates (OPEO)	9063-89-2 9036-19-5 38987-90-6 9002-93-1				

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
AZO DYES WHICH BY REDUCTIVE CLEAVAGE MAY RELEASE ONE OR MORE ARYLAMINES					
Biphenyl-4-ylamin, 4-aminobiphenyl xenylamine	92-67-1	Zero Discharge	Textile: EN 14362-1 (2012) EN 14362-3 (2012) (for azo colorants which may release 4-Aminoazobenzene) Leather: EN ISO 17234-1 (2015) EN ISO 17234-2 (2011) (for azo colorants which may release 4-Aminoazobenzene)	Usage ban 20mg/kg for every single substance	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 listed amines are restricted. Azo dyes are used in dyed fabric or leather. Restricted amines also may be present or formed during cleavage of unintended impurities in raw materials used for dyestuff production.
Benzidine	92-87-5				
4-chloro-o-toluidine	95-69-2				
2-naphtylamine	91-59-8				
o-aminoazotoluene, 4-amino-2',3-dimethylazobenzene, 4-o-tolylazo-otoluidine	97-56-3				
5-nitro-o-toluidine	99-55-8				
4-chloroaniline	106-47-8				
4,4'-methylenedianiline	615-05-4				
4,4'-diaminodiphenylmethane	101-77-9				
3,3'-dichlorobenzidine 3,3'-dichlorobiphenyl-4,4'-ylenediamine	91-94-1				
3,3-dimethoxybenzidine o-dianisidine	119-90-4				
3,3-dimethylbenzidine, 4,4'-bi-o-toluidine	119-93-7				
4,4'-methylenedi-o-toluidine	838-88-0				
6-methoxy-m-toluidine p-cresidine	120-71-8				
4,4'-metylene-bis-(2-chloro-aniline), 2,2'-dichloro-4,4'-ethylenedianiline	101-14-4				
4,4'-oxydianiline	101-80-4				
4,4'-thiodianiline	139-65-1				
o-toluidine, 2-aminotoluene	95-53-4				
4-methyl-m-phenylenediamine	95-80-7				
2,4,5-trimethylaniline	137-17-7				
o-anisidine (2-methoxyanilin)	90-04-0				
4-amino azobenzene	60-09-3				
2,4-xylidine	95-68-1				
2,6-xylidine	87-62-7				
2-Naphthylamine	91-59-8				

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
CHLOROBENZENES AND CHLOROTOLUENES					
Monochlorobenzene	108-90-7	Zero Discharge	DIN 54232 (2010)	Usage ban 5.0mg/kg sum of all	Chlorobenzenes (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.
Dichlorobenzenes, all isomers	Several				
1,2-Dichlorobenzene	95-50-1				
1,3-Dichlorobenzene	541-73-1				
1,4-Dichlorobenzene	106-46-7				
Trichlorobenzenes, all isomers	Several				
1,2,3-Trichlorobenzene	87-61-6				
1,2,4-Trichlorobenzene	120-82-1				
1,3,5-Trichlorobenzene	108-70-3				
Tetrachlorobenzenes, all isomers	Several				
1,2,3,4-Tetrachlorobenzene	634-66-2				
1,2,3,5-Tetrachlorobenzene	634-90-2				
1,2,4,5-Tetrachlorobenzene	95-94-3				
Pentachlorobenzene	608-93-5				
Hexachlorobenzene	118-74-1				
Monochlorotoluenes, all isomers	Several				
2-Chlorotoluene	95-49-8				
3-Chlorotoluene	108-41-8				
4-Chlorotoluene	106-43-4				
Dichlorotoluenes, all isomers	Several				
2,3-Dichlorotoluene	32768-54-0				
2,4-Dichlorotoluene	95-73-8				
2,5-Dichlorotoluene	19398-61-9				
2,6-Dichlorotoluene	118-69-4				
3,4-Dichlorotoluene	95-75-0				
3,5-Dichlorotoluene	25186-47-4				

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
CHLOROBENZENES AND CHLOROTOLUENES					
Trichlorotoluenes, all isomers	Several	Zero Discharge	DIN 54232 (2010)	Usage ban 5.0mg/kg sum of all	Chlorobenzenes (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.
2,3,4-Trichlorotoluene	7359-72-0				
2,3,6-Trichlorotoluene	2077-46-5				
2,4,5-Trichlorotoluene	6639-30-1				
2,4,6-Trichlorotoluene	23749-65-7				
3,4,5-Trichlorotoluene	21472-86-6				
Tetrachlorotoluenes, all isomers	Several				
2,3,4,5-Tetrachlorotoluene	76057-12-0				
2,3,5,6-Tetrachlorotoluene	29733-70-8				
2,3,4,6-Tetrachlorotoluene	875-40-1				
Pentachlorotoluene	877-11-2				
CHLOROPHENOLS					
Monochlorophenols (MonoCP), all isomers	25167-80-0	Zero Discharge	Extraction with KOH*/ GC-MS* *In case of results close to limit value (+/- 10 %) re-test with reference method: §64 LFGB BVL B 82.02-8 (2001) (for textiles) or ISO 17070 (2015) (for leather)	Usage ban 1.0mg/kg for all isomers	Chlorophenols are polychlorinated compounds used as preservatives or pesticides. Pentachlorphenol (PCP) and Tetrachlorphenol (TeCP) are sometimes used to prevent mould and kill insects when growing cotton and when storing/transporting fabrics. PCP/TeCP can also be used as a preservative in print pastes and in certain disperse dyes.
Dichlorophenols (DiCP), all isomers	25167-81-1			Usage ban 1.0mg/kg for all isomers	
Trichlorophenols (TriCP), all isomers	25167-82-2			Usage ban 0.5mg/kg for every single substance	
Tetrachlorophenols (TeCP), salts and compounds	25167-83-3				
Pentachlorophenol (PCP), salts, esters and compounds	87-86-5				

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
CARCINOGENIC DYES					
Acid Red 26	3761-53-3		DIN 54231	Usage ban 1g/L (20mg/kg) for every single substance	Most of these substances are regulated and should no longer be used for dyeing of textiles.
Basic Green 4	Several				
Malachit green	10309-95-2				
Malachit green chloride	569-64-2				
Malachit green oxalate	2437-29-8				
Basic Red 9	569-61-9				
Basic Violet 14	632-99-5				
Direct Black 38	1937-37-7				
Direct Blue 6	2602-46-2				
Direct Red 28	573-58-0				
Disperse Blue 1	2475-45-8				
Disperse Orange 11	82-28-0				
Disperse Yellow 3	2832-40-8				
Pigment Black 25	68186-89-0				
Pigment Yellow 34	1344-37-2				
Pigment Yellow 157	68610-24-2				
Pigment Red 104	12656-85-8				

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
ALLERGENIC DISPERSE DYES					
Disperse Blue 3	2475-46-9		DIN 54231	Usage ban 1g/L (20mg/kg) for every single substance	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 performing chemical bonds. Disperse Dyes are used in synthetic fiber (e.g. polyester, acetate, polyamide). Restricted disperse dyes are suspected of causing allergic reactions and should no longer be used for dyeing of textiles.
Disperse Blue 7	3179-90-6				
Disperse Blue 26	3860-63-7				
Disperse Blue 35	12222-75-2 56524-77-7				
Disperse Blue 102	12222-97-8				
Disperse Blue 106	12223-01-7				
Disperse Blue 124	61951-51-7				
Disperse Brown 1	23355-64-8				
Disperse Orange 1	2581-69-3				
Disperse Orange 3	730-40-5				
Disperse Orange 37/59/76	12223-33-5 13301-61-6 51811-42-8				
Disperse Red 1	2872-52-8				
Disperse Red 11	2872-48-2				
Disperse Red 17	3179-89-3				
Disperse Yellow 1	119-15-3				
Disperse Yellow 9	6373-73-5				
Disperse Yellow 39	12236-29-2				
Disperse Yellow 49	54824-37-2				
COLOURANTS BANNED FOR OTHER REASONS					
Basic Blue 26	2580-56-5		DIN 54231	Usage ban 1g/L (20mg/kg) for every single substance	Navy blue has a high aquatic toxicity and is harmful to the environment. Shall not be placed on the market or used for colouring textiles and leather articles.
Direct Yellow 1	6472-91-9				
Disperse Yellow 23	6250-23-3				
Disperse Orange 149	85136-74-9				
Navy Blue	118685-33-9				

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
FLAME RETARDANTS					
2,2-Bis(bromomethyl)-1,3-propanediol	3296-90-0	Zero Discharge	Extraction following IEC 62321-6 (2015) / LC-MS, GC-MS, GC-NCI Chlorinated paraffins: ISO 18219 (2015)	Usage ban 5mg/kg every single substance	Flame retardant chemicals potentially used in clothing and tent fabric (PU clothing's) to meet safety standards.
Bis(2,3-dibromopropyl)phosphate	5412-25-9				
Hexabromocyclododecan	25637-99-4 3194-55-6 134237-50-6 134237-51-7 134237-52-8				
Polybrominated diphenyl ethers (PBDE)	Several				
Tetrabromodiphenyl ether (TetraBDE)	40088-47-9				
Pentabromodiphenyl ether (PentaBDE)	32534-81-9				
Hexabromodiphenyl ether (HexaBDE)	36483-60-0				
Heptabromodiphenyl ether (HeptaBDE)	68928-80-3				
Octabromodiphenyl ether (OctaBDE)	32536-52-0				
Decabromodiphenyl ether (DecaBDE)	1163-19-5				
Tetrabromobisphenol A	79-94-7				
Tetrabromobisphenol A bis(2,3-dibromopropylether)	21850-44-2				
Triethylenephosphoramide (TEPA)	545-55-1				
Trimethyl phosphate	512-56-1				
Tri-o-cresyl phosphate	78-30-8				
Tris(chloroethyl)phosphate	115-96-8				
Tris-(2-chloro-1-methylethyl)phosphate (TCPP)	13674-84-5				
Tris-[2-chloro-1-(chloromethyl)ethyl]phosphate (TDCP)	13674-87-8				
Tris(2,3-dibromopropyl)phosphate (TRIS)	126-72-7				
Trixylyl phosphate	25155-23-1				

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
PERFLUORINATED CHEMICALS					
Perfluoroctanesulfonates (PFOS)	1763-23-1	Zero Discharge	CEN/TS 15968 (2010)	Usage ban 1 µg/m2	Perfluoroctane suphonate (PFOS) and Perfluorooctanoic acid (PFOA) may be present as unintended by-products in long-chain commercial water, oil and stain repellent agents. PFOA can also be generated from other by-products (esp. the telomer alcohols) contained in long-chain PFC. G-Star has a complete ban on the use of Perfluorinated Chemicals (long, but also short chain); alternative water repellent finishing has to be used.
Perfluoroctane acids (PFOA)	335-67-1			Usage ban 1 µg/m2	
1H,1H,2H,2H-Perfluorooctylacrylate (6:2 FTA)	17527-29-6		Solvent extraction, LC-MS	0.01 mg/kg	
1H,1H,2H,2H-Perfluorodecylacrylate (8:2 FTA)	27905-45-9				
1H,1H,2H,2H-Perfluorododecylacrylate (10:2 FTA)	17741-60-05				
1H,1H,2H,2H-Perfluoro-1-hexanol (4:2 FTOH)	2043-47-2			0.1 mg/kg	
1H,1H,2H,2H-Perfluoro-1oktanol (6:2 FTOH)	647-42-7				
1H,1H,2H,2H-Perfluoro-1-decanol (8:2 FTOH)	678-39-7				
1H,1H,2H,2H-Perfluoro-1-dodecanol (10:2 FTOH)	865-86-1				
GLYCOLS					
Bis(2-methoxyethyl)-ether	111-96-6		Textile: Extraction with MeOH / GC-MS Plastic: 2-Step extraction with THF and MeOH / GC-MS	Usage ban 5mg/kg	In apparel and footwear, solvents are used as finishing/cleaning and printing agents, for dissolving and diluting fats, oils and adhesives (e.g., in degreasing or cleaning operations).
2-Ethoxyethanol	110-80-5				
2-Ethoxyethyl acetate	111-15-9				
Ethylene glycol dimethyl ether	110-71-4				
2-Methoxyethanol	109-86-4				
2-Methoxyethylacetate	110-49-6				
2-Methoxy-1-propanol	1589-47-5				
2-Methoxypropylacetate	70657-70-4				
Triethylene glycol dimethyl ether	112-49-2				

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
POLYCHLORINATED BIPHENYLS (PCB'S) AND POLYCHLORINATED TERPHENYLS (PCT'S)					
Polybrominated biphenyls (PBBs)	Several		Extraction following IEC 62321-6 (2015) / GC-MS	Usage ban 5mg/kg	PCB's and PCT's are persistent organic pollutants and have entered the environment through both use and disposal. Polychlorinated biphenyls commonly known as PCBs are man made chemicals. These chlorinated oils have a low degree of reactivity. They are not flammable, have high electrical resistance, good insulating properties and are very stable even when exposed to heat and pressure. Uses for PCBs quickly expanded to include hydraulic fluids, casting wax, plasticizers, pigments, adhesives, fire-retardants; vapour suppressants to extend the kill-life of insecticides; coatings to render fabric flame-proof, rot-proof and water-repellent, lacquers, varnishes and paints.
Polychlorinated biphenyls (PCBs)	Several			Usage ban 1mg/kg for every single substance	
Polychlorinated terphenyls (PCTs)	Several				
Polybrominated terphenyls (PBTs)	Several				
Polychlorinated naphthalenes (PCNs)	Several				
Polybrominated naphthalenes (PBNs)	Several				
HALOGENATED DIARYLALKANES					
Monomethyl-dibromo-diphenyl methane	99688-47-8		Extraction following IEC 62321-6 (2015) / GC-MS	Usage ban 1mg/kg for every single substance	Halogenated monomethyldiphenylmethanes have similar chemical and ecotoxicologial properties like polychlorinated biphenyls (PCBs) and polychlorinated terphenyls (PCTs) and may form dioxins in the event of fire.
Monomethyl-dichloro-diphenyl methane	81161-70-8				
Monomethyl-tetrachloro-diphenyl methane	76253-60-6				
ISOCYANATES					
Diphenylmethane-4,4-diisocyanate (MDI)	101-68-8		EN 13130-8 (2004)	Free content 1mg/kg sum of all	Isocyanates are widely used in the manufacture of flexible and rigid foams, fibres, coatings, elastomers and polyurethane products.
Hexamethylene diisocyanate (HMDI)	822-06-0				
Isophorone diisocyanate (IPDI)	4098-71-9				
Tetramethylxylene diisocyanate (TMXDI)	2778-42-9				
Toluene-2,4-diisocyanate (2,4-TDI)	584-84-9				
Toluene-2,6-diisocyanate (2,6-TDI)	91-08-7				
MONOMERS					
Acrylamide	79-06-1		Textile: Extraction with MeOH / HPLC Plastic: 2-Step extraction with THF and MeOH / HPLC	1mg/kg	Acrylamide is used in the production of polymers and dyes. It is considered to be carcinogenic, mutagenic and reprotox.

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
OTHER CHEMICAL SUBSTANCES					
Acetophenone	98-86-2		Extraction with MeOH / GC-MS	20mg/kg	VOC's are organic chemical compounds that vaporize under normal conditions and enter the atmosphere. Common artificial VOCs include thinners and dry cleaning solvents.
Formamide	75-12-7		Extraction with MeOH* / GC-MS *Cut the samples into small pieces (2x2mm)	50mg/kg	
2-Phenyl-2-propanol	617-94-7		Extraction with MeOH / GC-MS	10mg/kg	
Bisphenol A	80-05-7		Extraction with MeOH / ISO 18857-2 (2009)	Usage ban textile 1mg/kg Accessories 50mg/kg	Bisphenol A can be found in plastic materials such as Polycarbonat. This substance is considered to be toxic to reproduction.
Cresol, all isomers	1319-77-3		Extraction with KOH* / GC-MS* *In case of results close to limit value (+/- 10 %) re-test with reference method: §64 LFGB BVL B 82.02-8 (2001) (for textiles) or ISO 17070 (2015) (for leather)	Usage ban 1mg/kg for every single substance	Cresols are precursors or synthetic intermediates to other compounds and materials, including plastics, pesticides, pharmaceuticals, and dyes.
m-Cresol	108-39-4				
o-Cresol	95-48-7				
p-Cresol	106-44-5				
Dimethylfumarate	624-49-7		ISO/TS 16186 (2012) / GC-MS	Usage ban 1mg/kg	Dimethyl fumarate (DMFu) is a fungicide used to prevent mould in leather and textiles. DMFu can cause acute dermatitis, eczema, and general fatigue. to the persons who have been in contact with this substance.
o-Phenylphenol	90-43-7		Textile: Extraction with KOH* / GC-MS* *In case of results close to limit value (+/- 10 %) re-test with reference method: §64 LFGB BVL B 82.02-8 (2001) Leather: ISO 13365 (2011)	Textile 50mg/kg Leather 100mg/kg	o-Phenylphenol can be used for its preservative properties in leather or as a carrier in dyeing processes. Can irritate the skin and cause in contact with eyes severe irritation and burns with possible eye damage.

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PHTHALATES					
Bis-(2-methoxyethyl) phthalate (DMEP)	117-82-8	Zero Discharge	ISO 14389 (2014)	Usage ban 0.005 %.(50 mg/kg) for every single substance	Phthalates are a class of organic compounds added to plastics to increase flexibility. In textiles and apparel, phthalates can be associated with flexible plastic components, trims, screen and plastisol prints. Phthalates are often classified as repro-toxic and can cause birth defects and changes in hormone levels. Phthalates can be found in Flexible Plastic components (e.g. PVC), Pigment printing, Adhesives, Plastic buttons, Plastic sleevings, Coatings, etc.
Butylbenzyl phthalate (BBP)	85-68-7				
Dibutyl phthalate (DBP)	84-74-2				
Di-cyclohexyl phthalate (DCHP)	84-61-7				
Diethylhexyl phthalate (DEHP)	117-81-7				
Diethyl phthalate (DEP)	84-66-2				
Diisobutyl phthalate (DIBP)	84-69-5				
Diisodecyl phthalate (DIDP)	26761-40-0 68515-49-1				
Diisononyl phthalate (DINP)	28553-12-0 68515-48-0				
Di-isooctyl phthalate (DIOP)	27554-26-3				
Di-iso-pentyl phthalate (DIPP)	605-50-5				
Dimethyl phthalate (DMP)	131-11-3				
Di-n-hexyl phthalate (DNHP)	84-75-3				
Di-n-octyl phthalate (DNOP)	117-84-0				
Dinonyl phthalate (DNP)	84-76-4				
Di-n-pentyl phthalate (DnPP)	131-18-0				
Di-n-propyl phthalate (DPRP)	131-16-8				
n-Pentyl-isopentyl phthalate	776297-69-9				
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)	71888-89-6				
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)	68515-42-4				
1,2-Benzenedicarboxylic acid, dipentyl ester, branched and linear	84777-06-0				
1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	68515-50-4				

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
POLYCYCLIC AROMATIC HYDROCARBONS (PAH'S)					
Acenaphtylene	208-96-8	Zero Discharge	EPA 8310 EPA 8270D EPA 8275A AfPS GS 2014:01	Usage ban 10mg/kg Sum of all PAHs 0.2mg/kg Benzo(a)pyrene 1.0mg/kg PAHs marked with (*)	Polycyclic Aromatic Hydrocarbons (PAHs) are natural components of crude oil and they are a common residue from oil refining. PAHs have a characteristic smell similar to the smell of car tires or asphalt. Oil residues containing PAHs are added in rubber and plastics as a softener or extender. Therefore, PAHs are risky in rubber, plastics, lacquers and coatings. PAHs are often found in the outsoles of footwear and in printing pastes of screen prints. PAHs can be present as impurities in Carbon Black. Clean mineral oils should be used in the rubber to avoid PAHs.
Acenaphthene	83-32-9				
Anthracene	120-12-7				
Benzo(a)anthracene*	56-55-3				
Benzo(b)fluoranthene*	205-99-2				
Benzo(j)fluoranthene*	205-82-3				
Benzo(k)fluoranthene*	207-08-9				
Benzo(ghi)perylene	191-24-2				
Benzo(a)pyrene	50-32-8				
Benzo(e)pyrene*	192-97-2				
Chrysene*	218-01-9				
Dibenzo(a,h)anthracene*	53-70-3				
Fluoranthene	206-44-0				
Fluorene	86-73-7				
Indeno(1,2,3-cd)pyrene	193-39-5				
Naphthalene	91-20-3				
Phenanthrene	85-01-8				
Pyrene	129-00-0				
POLYMERS					
Polyvinylchloride	9002-86-2		Beilstein test* / FTIR *FTIR measurement only if result of Beilstein test was positive	Usage ban Not detected	PVC is a widely used thermoplastic polymer. It can be made softer and more flexible by the addition of plasticizers, the most widely-used being phthalates. In this form, it is used in clothing and upholstery It is commonly used in coats, jackets, aprons and bags. The global phase-out of PVC is advocated because it is claimed that dioxin is produced as a byproduct of vinyl chloride manufacture and from incineration of waste PVC in domestic garbage.

RESTRICTED SUBSTANCES LIST 1.4

Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
SOLVENTS/CHLORINATED SOLVENTS					
Benzene	71-43-2	Zero Discharge	Headspace GC-MS	Usage ban 1mg/kg	These volatile organic compounds should not be used in textile auxiliary chemical preparations. They are associated with solvent-based processes like solvent-based PU coatings and glues/adhesives. They should not be used for any kind of facility cleaning or post-cleaning
1,2-Dichloroethane	107-06-2		Headspace GC-MS	Usage ban 1mg/kg	
Dichloromethane	75-09-2		Headspace GC-MS	Usage ban 1mg/kg	
N,N-Dimethylacetamide (DMAc)	127-19-5		Headspace GC-MS or Textile: Extraction with MeOH / GC-MS or LC-MS Plastic: 2-Step Extraction with THF and MeOH / GC-MS or LC-MS	Usage ban in auxiliaries with exception of solvent coating 5mg/kg	
N,N-Dimethylformamide (DMF)	68-12-2		ISO/TS 16189 (2013)	Usage ban with exception of solvent based coated articles 5mg/kg Solvent based articles 50mg/kg	
N-Ethyl-2-pyrrolidone (NEP)	2687-91-4		2-Step extraction with THF and MeOH / GC-MS or LC-MS	Usage ban with exception of solvent based coated articles 5mg/kg Solvent based articles 10mg/kg	
N-Methylpyrrolidone (NMP)	872-50-4				
Tetrachloroethylene (Perchloroethylene)	127-18-4		Headspace GC-MS	Usage ban 1mg/kg	
Toluene	108-88-3			50mg/kg	
Trichloroethylene	79-01-6			Usage ban 5mg/kg	
Xylene, all isomers	1330-20-7		Headspace GC-MS	Usage ban in textile finishes 1mg/kg Non textile articles 10mg/kg	
m-Xylene	108-38-3				
o-Xylene	95-47-6				
p-Xylene	106-42-3				

RESTRICTED SUBSTANCES LIST 1.4

Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
ORGANOTIN COMPOUNDS					
Monomethyltin compounds (MMT)	Several	Zero Discharge	ISO/TS 16179 (2012)	Usage ban 2.0mg/kg	Organotins are a 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 productions, and heat stabilizers in plastics/rubber. In textiles and apparel, organotins may be associated with textiles plastics/rubber, inks, paints, metallic glitter, and heat transfer material, but also in polyurethane coatings and polyurethane membranes.
Monobutyltin compounds (MBT)	Several			Usage ban 1.0mg/kg	
Monooctyltin compounds (MOT)	Several			Usage ban 2.0mg/kg	
Dimethyltin compounds (DMT)	Several			Usage ban 0.05mg/kg	
Dibutyltin compounds (DBT)	Several			Usage ban 1.0mg/kg	
Diphenyltin compounds (DPhT)	Several			Usage ban 2.0mg/kg	
Dioctyltin compounds (DOT)	Several			Usage ban 1.0mg/kg	
Trimethyltin compounds (TMT)	Several			Usage ban 0.05mg/kg	
Tripropyltin compounds (TPT)	Several			Usage ban 0.05mg/kg	
Tributyltin compounds (TBT)	Several			Usage ban 0.05mg/kg	
Triphenyltin compounds (TPhT)	Several			Usage ban 0.05mg/kg	
Trioctyltin compounds (TOT)	Several			Usage ban 0.05mg/kg	
Tetrabutyltin compounds (TTBT)	Several			Usage ban 0.5mg/kg	
Tetraoctyltin compounds (TTOT)	Several			Usage ban 0.5mg/kg	
Tricyclohexyltin compounds (TCyHT)	Several			Usage ban 0.5mg/kg	

RESTRICTED SUBSTANCES LIST 1.4

Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
HEAVY METALS, EXTRACTABLE					
Antimony (Sb)	7440-36-0	Zero Discharge	DIN EN ISO 105-E04 (2013) (acid sweat solution) // ISO 17294-2 (2003) or DIN EN ISO 11885 (2009)	30 mg/kg	Many heavy metals are bio accumulative when absorbed by the human body through perspiration and give cause for concern in health terms such as chronic toxicity, allergenic reactions and cancer.
Arsenic (As)	7440-38-2			1 mg/kg	
Cadmium (Cd)	7440-43-9			0.1 mg/kg	
Chromium (Cr)	7440-47-3			2 mg/kg leather 250 mg/kg	
Cobalt (Co)	7440-48-4			4 mg/kg	
Copper (Cu)	7440-50-8			50 mg/kg	
Lead (Pb)	7439-92-1			1 mg/kg	
Mercury (Hg)	7439-97-6			0.02 mg/kg	
Nickel (Ni)	7440-02--0			4mg/kg	
Chromium VI (Cr VI)	18540-29-9		Textile: DIN EN ISO 105-E04 (2013) (acid sweat solution) // ICP Leather: 17075 (2008)	Usage ban textiles not detected Leather 3mg/kg	Chromium III is used in leather tanning and can be oxidized into Chromium VI if processes are not well maintained.
Barium (Ba)	7440-39-3		EN 71-3 CNS 4797-4	1000mg/kg	The European Commission concluded that in order to ensure the best possible protection of children's health, it was necessary to apply migration limits for barium.
Selenium (Se)	7782-49-2		EN 71-3 CNS 4797-4	500mg/kg	The European Commission concluded that in order to ensure the best possible protection of children's health, it was necessary to apply migration limits for selenium.
HEAVY METALS, TOTAL CONTENT					
Cadmium and its compounds	7440-43-9		EN 1122 (2001) / ISO 17294-2 (2003) or DIN EN ISO 11885 (2009) Total digestion / ISO 17294-2 (2003) or DIN EN ISO 11885 (2009)	Usage ban non metal parts 40mg/kg Metal parts 40mg/kg	Compounds are found in or used as: Pigments (particularly red, orange, yellow, and green), Stabilizer for PVC plastic, Fertilizers, Biocides and paints (e.g. surface paints on zippers and buttons.)
Lead (Pb)	7439-92-1		Total digestion / ISO 17294-2 (2003) or DIN EN ISO 11885 (2009)	Usage ban non metal parts 40mg/kg Metal parts 90mg/kg	In apparel and footwear, lead may be associated with plastics, paints, inks, pigments, surface coatings and metal components.

RESTRICTED SUBSTANCES LIST 1.4

Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
HEAVY METALS, RELEASABLE NICKEL					
Nickel	7440-02-0	Zero Discharge	Nickel release EN 12472 (2005)+A1(2009); EN 1811 (2011)	In metal products or parts of products intented to be used for body piercings: < 0.2 µg nickel per cm² per week (<0.11µg). Consumer goods such as jewellery, snap fasteners, press buttons, zip fasteners, etc., which can come into contact with the human skin for a longer period must not release more than < 0.5 µg nickel per cm² per week (<0.28µg). In spectacle frames and sunglasses intended to come into close and prolonged contact with the skin: < 0.5 µg nickel per cm² per week (<0.28µg).	Nickel: Is mainly used for plating of alloys, improving the corrosion resistance in alloys, improving the hardness of alloys and is a key element in the production of stainless steel. Certain dyestuffs contain complex bound Nickel. Both Nickel metal and Nickel compounds can occur as an impurities in pigments and alloys.
CHLORINATED PARAFFINS					
Paraffin, C10-C13, chlorinated (SCCP)	85535-84-8	Zero Discharge	EN ISO 18219 (modified)	<100mg/kg	Short Chain Chlorinated Paraffins are used as flame retardants, in plasticizers, paints and adhesives and for fat liquoring of leather. Short Chain Chlorinated Paraffins may cause long-term adverse effects in the aquatic environment.
Paraffin, C14-C17, chlorinated (MCCP)	85535-85-9				Medium Chain Chlorinated Paraffins used as secondary plasticiser in PVC, can also be used in metal working fluids, paints, varnishes, adhesives/sealants, flame retardants, leather fat liquors, carbonless copy paper.

RESTRICTED SUBSTANCES LIST 1.4

Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
OTHER ATTENTION POINTS					
pH value for textiles			ISO 3071	Articles with direct skin contact: 4.0 - 7.5 Articles without direct skin contact: 4.0 - 9.0	pH is a measure of the acidity or basicity of a solution. A solution with pH is 7 is neutral. pH values that do not fall within the specified limits can cause skin irritation.
pH value for leather			ISO 4045	Articles with direct skin contact: 3.5 - 7.5 Articles without direct skin contact: 3.5 - 9.0	
ODOUR			SNV 195651	No unpleaseant odour shall be emitted from the products.	

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
ASBESTOS					
Actinolite	77536-66-4		REM/EDX BGI 505-46 or U.S. EPA/600/R-93/116	Usage ban not detected	Asbestos is a naturally occurring group of fibrous silicate minerals. These thin, long, and flexible fibers can be used in textiles. Asbestos fibers are strong, durable and fire resistant. Asbestos fibres are carcinogenic. It is unlikely that they are found in current textiles except for fire-fighting clothing.
Amosite	12172-73-5				
Anthophyllite	77536-67-5				
Chrysotile	12001-29-5				
Crocidolite	12001-28-4				
Tremolite	77536-68-6				
DIOXINS AND FURANS					
Group 1:	**Several**		EPA 8290A	Sum of group 1: 1.0 [µg/kg]	Dioxins/furans are common by-products of incomplete burning of organics in a chlorine rich environment. They are often associated with the production of pesticides and PVC.
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6				
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4				
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9				
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4				
Group 2:	**Several**			Sum of group 1 and 2: 5.0 [µg/kg]	
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6				
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7				
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3				
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6				
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9				
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9				
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9				
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5				

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
DIOXINS AND FURANS					
Group 3:	**Several**		EPA 8290A	Sum of group 1, 2 and 3: 100 [µg/kg]	Dioxins/furans are common by-products of incomplete burning of organics in a chlorine rich environment. They are often associated with the production of pesticides and PVC.
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9				
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	3268-87-9				
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4				
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7				
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0				
Group 4:	**Several**			Sum of group 4: 1.0 [µg/kg]	
2,3,7,8-Tetrabromodibenzo-p-dioxin	50585-41-6				
1,2,3,7,8-Pentabromodibenzo-p-dioxin	109333-34-8				
2,3,7,8-Tetrabromodibenzofuran	67733-57-7				
2,3,4,7,8-Pentabromodibenzofuran	131166-92-2				
Group 5:	**Several**			Sum of group 4 and 5: 5.0 [µg/kg]	
1,2,3,4,7,8-Hexabromodibenzo-p-dioxin	110999-44-5				
1,2,3,6,7,8-Hexabromodibenzo-p-dioxin	110999-45-6				
1,2,3,7,8,9-Hexabromodibenzo-p-dioxin	110999-46-7				
1,2,3,7,8-Pentabromodibenzofuran	107555-93-1				

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
FLUORINATED GREENHOUSE GASES					
Sulphur hexafluoride – SF6	2551-62-4				
Perfluoromethane	75-73-0				
Perfluoroethane	76-16-4				
Perfluoropropane	76-19-7				
Perfluorobutane	355-25-9				
Perfluoropentane	678-26-2				
Perfluorohexane	355-42-0				
Perfluorocyclobutane	115-25-3				
HFC-23	75-46-7				
HFC-32	75-10-5				
HFC-41	593-53-3				
HFC-43-10mee	138495-42-8				
HFC-125	354-33-6		Headspace GC-MS	Usage ban 0.1mg/kg	
HFC-134	359-35-3				
HFC-134a	811-97-2				
HFC-152a	75-37-6				
HFC-143	430-66-0				
HFC-143a	420-46-2				
HFC-227ea	431-89-0				
HFC-236cb	677-56-5				
HFC-236ea	431-63-0				
HFC-236fa	690-39-1				
HFC-245ca	679-86-7				
HFC-245fa	460-73-1				
HFC-365mfc	406-58-6				

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
OZONE DEPLETING SUBSTANCES					
Ozone-depleting substances (CFC's) class I	**Several**				
Trichlorofluoromethane CFC-11	75-69-4				
Dichlorofluoromethane CFC-12	75-71-8				
1,1,2-Trichloro-1,2,2-trifluoroethane CFC-113	76-13-1				
1,1,1-Trichloro-2,2,2-trifluoroethane CFC-113a	354-58-5				
1,2-Dichloro-1,1,2,2-tetrafluoroethane CFC-114	76-14-2				
1,1-Dichloro-1,2,2,2-tetrafluoroethane CFC-114a	374-07-2				
Monochloropentafluoroethane CFC-115	76-15-3				
Bromochlorodifluoromethane Halon-1211	353-59-3				
Bromotrifluoromethane Halon-1301	75-63-8				
Dibromotetrafluoroethane Halon-2402	124-73-2				
Chlorotrifluoromethane CFC-13	75-72-9				
Pentachlorofluoroethane CFC-111	354-56-3		Headspace GC-MS	Usage ban 0.1mg/kg for direct use in manufacturing of articles	
1,1,2,2-Tetrachloro-1,2-difluoroethane CFC-112	76-12-0				
1,1,1,2-Tetrachlorodifluoroethane CFC-112a	76-11-9				
Heptachlorofluoropropane CFC-211	422-78-6				
Hexachlorodifluoropropane CFC-212	3182-26-1				
Pentachlorotrifluoropropane CFC-213	2354-06-5				
Tetrachlorotetrafluoropropane CFC-214	29255-31-0				
1,1,3-Trichloropentafluoropropane CFC-215	76-17-5				
1,2,3-Trichloropentafluoropropane CFC-215	1652-81-9				
1,1,1-Trichloropentafluoropropane CFC-215	4259-43-2				
1,2,2-Trichloropentafluoropropane CFC-215	1599-41-3				
Dichlorohexafluoropropane CFC-216	661-97-2				
Monochloroheptafluoropropane CFC-217	422-86-6				

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
OZONE DEPLETING SUBSTANCES					
Ozone-depleting substances (CFC's) class I	**Several**				
Carbon tetrachloride CCl4	56-23-5				
1,1,1-Trichloroethane (Methylchloroform)	71-55-6				
Methylbromide (CH3Br)	74-83-9				
CHFBr2	1868-53-7				
CHF2Br	1511-62-2				
CH2FBr	373-52-4				
C2HFBr4	353-93-5				
C2HF2Br3	353-97-9				
C2HF3Br2	354-04-1				
C2HF4Br	354-07-4				
C2H2FBr3	172912-75-3				
C2H2F2Br2	75-82-1		Headspace GC-MS	Usage ban 0.1mg/kg for direct use in manufacturing of articles	
C2H2F3Br	421-06-7				
C2H3FBr2	358-97-4				
C2H3F2Br	359-07-9				
C2H4FBr	762-49-2				
C3HFBr6	-				
C3HF2Br5	-				
C3HF3Br4	-				
C3HF4Br3	666-48-8				
C3HF5Br2	431-78-7				
C3HF6Br	2252-79-1				
C3H2FBr5	-				
C3H2F2Br4	148875-98-3				

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
OZONE DEPLETING SUBSTANCES					
Ozone-depleting substances (CFC's) class I	**Several**				
C3H2F3Br3	431-48-1				
C3H2F4Br2	460-86-6				
C3H2F5Br	460-88-8				
C3H3FBr4	-				
C3H3F2Br3	666-25-1				
C3H3F3Br2	460-60-6				
C3H3F4Br	460-67-3				
C3H4FBr3	75372-14-4				
C3H4F2Br2	51584-25-9				
C3H4F3Br	460-32-2				
C3H5FBr2	453-00-9				
C3H5F2Br	461-49-4		Headspace GC-MS	Usage ban 0.1mg/kg for direct use in manufacturing of articles	
C3H6FBr	1871-72-3				
Ozone-depleting substances (CFC's) class II	**Several**				
Dichlorofluoromethane HCFC-21	75-43-4				
Monochlorodifluoromethane HCFC-22	75-45-6				
Monochlorofluoromethane HCFC-31	593-70-4				
Tetrachlorofluoroethane HCFC-121	354-14-3				
Trichlorodifluoroethane HCFC-122	354-21-2				
Dichlorotrifluoroethane HCFC-123	306-83-2				
Monochlorotetrafluoroethane HCFC-124	2837-89-0				
Trichlorofluoroethane HCFC-131	359-28-4				
Dichlorodifluoroethane HCFC-132	1649-08-7				
Monochlorotrifluoroethane HCFC-133a	75-88-7				

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
OZONE DEPLETING SUBSTANCES					
Ozone-depleting substances (CFC's) class II	**Several**				
HCFC-141	-				
Dichlorofluoroethane HCFC-141b	1717-00-6				
HCFC-142	-				
Monochlorodifluoroethane HCFC-142b	75-68-3				
HCFC-151	-				
Hexachlorofluoropropane HCFC-221	422-26-4				
Pentachlorodifluoropropane HCFC-222	422-49-1				
Tetrachlorotrifluoropropane HCFC-223	422-52-6				
Trichlorotetrafluoropropane HCFC-224	422-54-8				
HCFC-225	-				
Dichloropentafluoropropane HCFC-225ca	422-56-0				
Dichloropentafluoropropane HCFC-225cb	507-55-1		Headspace GC-MS	Usage ban 0.1mg/kg for direct use in manufacturing of articles	
Monochlorohexafluoropropane HCFC-226	431-87-8				
Pentachlorofluoropropane HCFC-231	421-94-3				
Tetrachlorodifluoropropane HCFC-232	460-89-9				
Trichlorotrifluoropropane HCFC-233	7125-84-0				
Dichlorotetrafluoropropane HCFC-234	425-94-5				
Monochloropentafluoropropane HCFC-235	460-92-4				
Tetrachlorofluoropropane HCFC-241	666-27-3				
Trichlorodifluoropropane HCFC-242	460-63-9				
Dichlorotrifluoropropane HCFC-243	460-69-5				
Monochlorotetrafluoropropane HCFC-244	134190-50-4				
Monochlorotetrafluoropropane HCFC-251	421-41-0				
Dichlorodifluoropropane HCFC-252	819-00-1				

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
OZONE DEPLETING SUBSTANCES					
Ozone-depleting substances (CFC's) class II	**Several**		Headspace GC-MS	Usage ban 0.1mg/kg for direct use in manufacturing of articles	
Monochlorotrifluoropropane HCFC-253	460-35-5				
Dichlorofluoropropane HCFC-261	420-97-3				
Monochlorodifluoropropane HCFC-262	421-02-3				
Monochlorofluoropropane HCFC-271	430-55-7				
PESTICIDES					
Aldrine	309-00-2		ASE or Soxhlet Extraction with Acetone/ Hexane / GC-MS or LC-MC	Usage ban 0.5mg/kg sum of all	Pesticides are substances or mixtures of substances used to kill a pest. A pesticide may be a chemical substance, biological agent (such as a virus or bacteria), antimicrobial, disinfectant or device used against any pest. Although there are benefits to the use of pesticides, there are also drawbacks, such as potential toxicity to humans and animals. In textiles and apparel, these pesticides may be found in natural fibres, primarily cotton.
Azinphos methyl	86-50-0				
Azinphos ethyl	2642-71-9				
Bromophos-ethyl	4824-78-6				
Captafol	2425-06-1				
Carbaryl	63-25-2				
Chlordane	57-74-9				
Chlordecone	143-50-0				
Chlordimeform	6164-98-3				
Chlorfenvinphos	470-90-6				
Coumaphos	56-72-4				
Cyfluthrin	68359-37-5				
Cyhalothrin, λ-	91465-08-6				
Cypermethrin	52315-07-8				
Deltamethrin	52918-63-5				
Diazinon	333-41-5				
o,p'-Dichlorodiphenyldichloroethane (o,p'-DDD)	53-19-0				
p,p'-Dichlorodiphenyldichloroethane (p,p'-DDD)	72-54-8				
o,p'-Dichlorodiphenyldichloroethylene (o,p'-DDE)	3424-82-6				

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Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
PESTICIDES					
p,p'-Dichlorodiphenyldichloroethylene (p,p'-DDE)	72-55-9		ASE or Soxhlet Extraction with Acetone/ Hexane / GC-MS or LC-MC	Usage ban 0.5mg/kg sum of all	Pesticides are substances or mixtures of substances used to kill a pest. A pesticide may be a chemical substance, biological agent (such as a virus or bacteria), antimicrobial, disinfectant or device used against any pest. Although there are benefits to the use of pesticides, there are also drawbacks, such as potential toxicity to humans and animals. In textiles and apparel, these pesticides may be found in natural fibres, primarily cotton.
o,p'-Dichlorodiphenyltrichloroethane (o,p'-DDT) and its isomers; preparations containing DDT and its isomers	789-02-6				
p,p'-Dichlorodiphenyltrichloroethane (p,p'-DDT) and its isomers; preparations containing DDT and its isomers	50-29-3				
2,4-Dichlorophenoxyacetic acid, its salts and compounds	94-75-7				
Dichlorprop	120-36-2				
Dicrotophos	141-66-2				
Dieldrine	60-57-1				
Dimethoate	60-51-5				
Dinoseb and salts	88-85-7				
Endosulfan, α-	959-98-8				
Endosulfan, β-	33213-65-9				
Endrine	72-20-8				
Esfenvalerate	66230-04-4				
Fenvalerate	51630-58-1				
Heptachlor	76-44-8				
Heptachlor epoxide	1024-57-3				
Hexachlorocyclohexane (HCH), all isomers	608-73-1				
Isodrin	465-73-6				
Kelevane	4234-79-1				
Lindane	58-89-9				
Malathion	121-75-5				
MCPA	94-74-6				
MCPB	94-81-5				

APPENDIX

Chemical Substance	Cas number	Zero Discharge	Test method	G-Star restricted limit	Relevance Of Restriction
PESTICIDES					
Mecoprop	93-65-2		ASE or Soxhlet Extraction with Acetone/ Hexane / GC-MS or LC-MC	Usage ban 0.5mg/kg sum of all	Pesticides are substances or mixtures of substances used to kill a pest. A pesticide may be a chemical substance, biological agent (such as a virus or bacteria), antimicrobial, disinfectant or device used against any pest. Although there are benefits to the use of pesticides, there are also drawbacks, such as potential toxicity to humans and animals. In textiles and apparel, these pesticides may be found in natural fibres, primarily cotton.
Methamidophos	10265-92-6				
Methoxychlor	72-43-5				
Methyl parathion	298-00-0				
Mevinophos	7786-34-7				
Mirex	2385-85-5				
Monocrotophos	6923-22-4				
Ethyl parathion	56-38-2				
Perthane	72-56-0				
Profenophos	41198-08-7				
Propetamphos	31218-83-4				
Quinalphos	13593-03-8				
Strobane	8001-50-1				
Telodrin	297-78-9				
Toxaphene	8001-35-2				
Tribufos (DEF)	78-48-8				
2,4,5-Trichlorophenoxyacetic acid, salts and compounds	93-76-5				
Trifluralin	1582-09-8				

G-STAR RAW

REACH REGULATION 1907/2006

VERSION 1.4 - NOVEMBER 2016

REACH ANNEX ECHA'S CANDIDATE LIST OF SUBSTANCES OF VERY HIGH CONCERN/AUTHORIZATION LIST

ECHA, the European Chemical Agency located in Helsinki, Finland is the organization managing the REACH process. REACH is the abbreviation for Registration, Evaluation, Authorisation and Restriction of Chemicals.

Substances, preparations and articles will be assessed on their risks for health and environmental aspects.

Any producer or importer of articles shall submit a notification to the Agency for any substance contained in those articles, if the following conditions are met:

a) a substance of the candidate list is present in the imported/ produced articles with over 0.1% w/w.
b) this substance is present in all produced or imported articles with an amount of over 1 tonne a year per importer or producer.

According to article 33 (1) of the REACH REGULATION 1907/2006 manufacturers and importers of articles (products) are required to notify their customers of the presence of any Substances of Very High Concern (SVHC) in their products exceeding 0.1% by weight and provide instructions on safe use of the product.

- Determination whether products contain any SVHCs >0.1% by weight.
- Disclose the presence of SVHCs in products within 45 days upon request from consumers or customers.
- Ensure environmental compliance and safety of the product.

The full list of Substances of Very High Concern can be found here:

Candidate List of Substances of Very High Concern for authorisation

After a two-step regulatory process, SVHCs may be included in the Authorisation List and become subject to authorisation. These substances cannot be placed on the market or used after a given date, unless an authorisation is granted for their specific use, or the use is exempted from authorisation.

Further documentation or more detailed information on the identification process of Substances of Very High Concern can be found on the web pages of ECHA's Member State Committee.

REACH ANNEX XIV AUTHORIZATION LIST

The full list of Substances Subject to Authorization can be found here:

Authorisation List - ECHA

WHAT ALL SUPPLIERS AND SOURCES SHOULD DO

Every G-Star Supplier and Source agree to inform G-Star of any substances listed in the candidate present in any G-Star product with over 0.1% w/w (>1000 mg/kg). The European Court of Justice judgement of 10-09-2015 case C-106/14 is referring to every constituent part of the article. In supplying this information G-Star does not intend to assume all or any part of our Suppliers' and/or Sources' duty to comply with the regulation. Chemicals, substances and articles will be assessed on their risks for health and environmental aspects.

All G-Star Suppliers and Sources shall visit the European Chemicals Agency (ECHA) website (www.echa. europa.eu) regularly and comply with the published obligations and guidance regarding chemicals and consumer articles.

To help ensure that all products supplied to G-Star comply with REACh, each Supplier and Source is obligated to track not only the current SVHCs, as listed on the ECHA website, but also the entire list of potential SVHCs. Suppliers and Sources shall map each step in their supply chains, including the sourcing and processing of Materials, Chemicals and Other Goods ingredients, and immediately inform G-Star. according to the Information Duty (Article 33) of all cases where a substance listed in the Candidate List of Substances of Very High Concerns for Authorization is present in the product or other Materials, Chemicals and Other Goods provided for use in any G-Star labeled or distributed product. Additionally, authorization requirements (as per Annexure XIV) and restriction requirements (as per Annexure XVII) in REACh regulation shall be considered by any Suppliers or Sources situated in Europe.

G-STAR RAW

MATERIAL FLOWCHART

VERSION 1.4 - NOVEMBER 2016

FABRICS & YARNS OF NATURAL ORIGIN INCL. REGENERATED NATURAL FIBRES, EXCLUDING LEATHER

Product groups: Trousers, shorts, jackets, skirts, dresses, coats, knitwear, bags, jewllery and all other items made of above mentioned fibers.

CHEMICALS	GENERAL	IS THE FABRIC/YARN DYED?	IS THE FIBER/YARN/FABRIC FINISHED/COATED?	IS THE TREATMENT FOR ANTI-CREASING/ANTI-SHRINKAGE OR WATER REPELLENT?	IS THE FABRIC/GARMENT PRINTED?	HAS THE GARMENT BEEN WASHED?
CHLORINATED PARAFFINS					X	
CARCINOGENIC DYES						
AZO DYES		X			X	
FLAME RETARDENTS		X				
FORMALDEHYDE						
HEAVY METAL EXTRACTABLES			X	X		
HEAVY METAL TOTAL CONTENT		X				
LEAD & CADMIUM			X		X/Cadmium	
ORGANOTIN COMPOUNDS			X		X	
CHLOROPHENOLS	X					
PERFLUORINATED CHEMICALS	X			X		
PESTICIDES	X				X	
PHTHALTES			X			
BIOCIDES						
ALKYLPHENOL AND ALKYPHENOL ETHOXYLATES	X	X			X	X
POLYAROMATIC HYDROCARBONS			X			
PVC					X	
pH	X					

FABRICS & YARNS OF SYNTHETIC ORIGIN OR BLEND

Product groups: Trousers, shorts, jackets, skirts, dresses, coats, knitwear, bags, jewllery and all other items made of above mentioned fibers.

CHEMICALS	GENERAL	IS THE FABRIC/YARN DYED?	IS THE FIBER/YARN/FABRIC FINISHED/COATED?	IS THE TREATMENT FOR ANTI-CREASING/ANTI-SHRINKAGE OR WATER REPELLENT?	IS THE FABRIC/GARMENT PRINTED?	HAS THE GARMENT BEEN WASHED?
CHLOROBENZENES AND CHLOROTOLUENES		X				
CHLORINATED PARAFFINS					X	
ALLERGENIC DISPERSE DYES		X				
CARCINOGENIC DYES		X				
AZO DYES		X			X	
FLAME RETARDENTS						X
FORMALDEHYDE			X	X		
HEAVY METAL EXTRACTABLES		X				
HEAVY METAL TOTAL CONTENT LEAD & CADMIUM			X		X	
ORGANOTIN COMPOUNDS			X		X	
CHLOROPHENOLS	X					
PERFLUORINATED CHEMICALS	X			X		
PESTICIDES						
PHTHALTES			X		X	
BIOCIDES	X					
ALKYLPHENOL AND ALKYPHENOL ETHOXYLATES	X	X			X	X
POLYAROMATIC HYDROCARBONS			X			
PVC					X	
pH	X					
FLUORINATED GREENHOUSE GASES	X					

LEATHER, FAKE LEATHER & PLASTIC PRODUCTS

Product groups: Garments, shoes, bags, belts, accessoires, jewellery and all other items made from the containing materials mentioned above.

CHEMICALS	IS THE PRODUCT MADE OF GENUINE LEATHER OR PARTLY MADE WITH BONDED LEATHER?	IS THE GENUINE LEATHER/ BONDED LEATHER DYED?	IS THE PRODUCT MADE OF FAKE LEATHER?	IS THE FAKE LEATHER DYED?	ARE PARTS OF THE PRODUCT MADE OF METAL?
CHLORINATED PARAFFINS	X		X		
CARCINOGENIC DYES		X			
AZO DYES		X		X	
FLAME RETARDENTS				X	
FORMALDEHYDE	X		X		
HEAVY METAL EXTRACTABLES		X			
CHROMIUM VI	X			X	
HEAVY METAL TOTAL CONTENT LEAD & CADMIUM			X		
NICKEL RELEASE					X
ORGANOTIN COMPOUNDS			X		X
CHLOROPHENOLS	X				
PERFLUORINATED CHEMICALS	X				
PESTICIDES	X				
PHTHALTES			X		
BIOCIDES	X		X		
ALKYLPHENOL AND ALKYPHENOL ETHOXYLATES	X	X	X	X	X
POLYAROMATIC HYDROCARBONS			X		
PVC			X		
SOLVENT AND VOC's	X		X		
pH	X		X		
FLUORINATED GREENHOUSE GASES	X		X		

TRIMMINGS

Such but not limited to: cords, tapes, ribbons, pipings, zipper pullers, sequins, laces, toglles, applications, velcro, yarns.

CHEMICALS	ARE PARTS OF THE TRIMMINGS PAINTED/ COATED?	ARE PARTS OF THE TRIMMINGS MADE OF PLASTIC OR COATD WITH PLASTIC?	ARE PARTS OF THE TRIMMINGS MADE OF/WITH FABRIC?	ARE PARTS OF THE TRIMMING MADE OF METAL?	ARE PARTS OF THE TRIMMING MADE OF LEATHER?
CHLOROBENZENES AND CHLOROTOLUENES			X		
CHLORINATED PARAFFINS		X			
ALLERGENIC DISPERSE DYES			X		
CARCINOGENIC DYES			X		X
AZO DYES			X		X
CHROMIUM VI					X
HEAVY METAL TOTAL CONTENT LEAD & CADMIUM	X	X		X	X
NICKEL RELEASE	X			X	
PHTHALTES		X			
BIOCIDES					X
ALKYLPHENOL AND ALKYPHENOL ETHOXYLATES	X		X	X	X
POLYAROMATIC HYDROCARBONS		X			
PVC		X			

PRINTS

CHEMICALS	WATER BASE	PIGMENT	RUBBER	PLASTISOL	HIGH DENSITY	DISCHARGE	PUFF	INJECTED MOLDED SILICON PRINT OIL BASE
CHLORINATED PARAFFINS			X	X				
AZO DYES	X	X	X	X	X	X	X	X
HEAVY METAL EXTRACTABLE		X						
HEAVY METAL TOTAL CONTENT LEAD & CADMIUM				X				
FORMALDEHYDE				X		X		
ORGANOTIN COMPOUNDS			X	X			X	X
PHTHALTES			X	X			X	X
ALKYLPHENOL AND ALKYPHENOL ETHOXYLATES	X	X	X	X	X	X	X	X
PVC			X	X				

G-STAR RAW

EXPLANATION OF SUBSTANCES

VERSION 1.4 - NOVEMBER 2016

EXPLANATION ON THE ACTION OF SUBSTANCES

ASBESTOS	is a naturally occurring group of fibrous silicate minerals. These thin, long, and flexible fibers can be used in textiles. Asbestos fibers are strong, durable and fire resistant. Asbestos fibres are carcinogenic. It is unlikely that they are found in current textiles except for fire-fighting clothing.
CHLOROBENZES AND CHLOROTOLUENES	are used in batch dyeing of synthetic fibres, particularly polyester fibres, to promote the absorption and diffusion of disperse dyes into the fibre at relative low temperatures. Carriers are important for dyeing blends of wool and polyester as wool cannot be dyed at higher temperatures than boiling. There is a risk that the carriers will remain on the textile material or partially evaporate during subsequent processes. Most of these carriers are toxic to humans and aquatic organisms, and some are even carcinogenic.
CHLORINATED PARAFFINS	are polychlorinated alkanes and they are divided into three categories depending on the length of the carbon chain, short (C10-C13), medium (C14-C17), and long (C20-C30). Short chain chlorinated paraffins are used as flame retardants for plastics. They are also used as a plasticizer in rubber, paints, adhesives and fat liquoring agents in leather processing. Short Chain Chlorinated Paraffins are classified as dangerous to the environment because they are very toxic to aquatic organisms, and may cause long-term adverse effects in the aquatic environment.
ALLERGENIC DISPERSE DYES	are generally water-insoluble colourants that are mainly used for dying polyester, nylon and cellulose acetate. Some disperse dyes have an allergenous (sensitizing) potential to the human skin and can be considered as a possible threat to health, especially if the dyes exhibit poor colour fastness to perspiration fastness.
AZO DYES	which by reductive cleavage may release one of more aromatic arylamines incorporate one or several azo groups (N=N) bound with aromatic compounds. Thousands of azo dyes exist, however, only those which can degrade to form the listed amines are considered to be carcinogenic and are therefore restricted in textiles, leather, apparel and toys.
CARCINOGENIC DYES	From the listed dyestuffs it is proven that they are carcinogenic.
DYES WITH ENVIRONMENTAL PROBLEMS	It has been assessed that this blue colourant harms the environment as it has a high aquatic toxicity, is not easily degradable and reaches the environment via waste water.
BROMINATED AND CHLORINATED FLAME RETARDENTS	are chemical compounds that can be incorporated into textiles or applied by sprays to prevent burning. Brominated flame retardants are used in a wide range of products like automobiles, electronics and textiles because of their stability and heat resistance. Some flame retardents are as toxic as PCB's and DDT and are suspected to be carcinogenic. They persist once they enter the environment and food chain, and are likely to pass up the food chain.
FORMALDEHYDE	is a volatile organic compound whose chemical properties make it suitable to be used for crosslinking, anti-creasing, anti-shrinking, water repellence finishing etc.to fabrics. It can be mixed with phenol and urea to form polymeric resins. In textiles and apparel, formaldehyde may be found in stiffened and permanent pressed fabric. Formaldehyde is a toxic chemical which can induce irritation to mucous membrane and is suspected to cause cancer.
HEAVY METALS (GENERAL)	are found in dyestuffs and used as dye-fixing agents. They also occur in natural fibres like cotton. Many heavy metals are bio accumulative when absorbed by the human body through perspiration and give cause for concern in health terms such as chronic toxicity, allergenic reactions and cancers.
ANTIMONY	is used in flame-proofing, paints, ceramics, enamels, a wide variety of alloys, electronics, and rubber. The flame-retardant applications can include children's clothing, toys, aircraft and automobile seat covers.
ARSENIC	is a notoriously poisonous metalloid. The toxicity of arsenic to insects, bacteria and fungi makes it an ideal component for the preservation of wood.
CADMIUM	is a naturally occurring metal. In textiles and apparels, cadmium is usually used as pigments, coatings, stabilizers in plastics, dyes, paints, inks and metal accessories. Cadmium is also a well known stabilizer for the manufacturing of polymers like PVC. Cadmium and its derivatives are suspected to be carcinogenic.
NICKEL	Nickel is metal often combined with other metals to create alloys with increased hardness and resistance to corrosion. In textiles and apparel, nickel is mainly found in accessories for textiles and clothing, paints, inks, trims, plastics, and metal components. Nickel can cause extreme allergies.
CHROMIUM VI	In textiles and apparels, Chromium VI is usually associated with chrome tanned leather. Chromium VI can cause skin irritation and is considered to be carcinogenic.
COBALT	is a hard, lustrous, grey metal. Cobalt compounds have been used for centuries to impart a rich blue color to glass, glazes, and ceramics. After nickel and chromium, cobalt is a major cause of contact dermatitis. At higher levels of exposure cobalt shows mutagenic and carcinogenic effects
COPPER	is a metal with very high thermal and electrical conductivity. Copper is an essential trace nutrient to all high plant and animal life. In animals, including humans it is found primarily in the bloodstream, as a cofactor in various enzymes and in copper-based pigments. However, in sufficient amounts, copper can be poisonous and even fatal to organisms.
LEAD	is a soft, metal, also considered to be one of the heavy metals. Lead is a poisonous metal that can damage nervous connections (especially in young children) and cause blood and brain disorders. In textiles and apparel, lead can be found in plastics, paints, inks, pigments, and metal components.
MERCURY	also called quicksilver is a heavy metal. Mercury is liquid at or near room temperature and pressure. Mercury exposure at high levels can harm the brain, heart, kidneys, lungs and immune system.
ISOCYANATES	Isocyanates are widely used in the manufacture of flexible and rigid foams, fibres, coatings, elastomers and polyurethane products.Isocyanates create a strong and unpleasent odour.
ORGANOTIN COMPOUNDS	are a class of chemicals combining tin and organics such as butyl and phenyl groups. Organotin are predominantly found in the environment as antifoulants in marine paints, but they can also be used as biocides (antibacterials), and/or heat stabilizers in plastics. In textiles and apparel, organotins may be used in plastics, inks, paints, and heat transfer material. It is also used to prevent unpleasant odours.
CHLOROPHENOLS	are polychlorinated compounds used as a preservative to wood, leather, and textiles. PCP and TeCP have been used as an antifungal in wood products, textiles, and leather.PCP and TeCP are irritatants to the skin, eyes and mouth and can cause harmful effects to the liver, kidneys, blood and lungs and are probable human carcinogens.
PERFLUORINATED CHEMICALS	are organofluorine compounds and are often used as surfactants. Like other fluorocarbons it repels water. PFOS is the main ingredient in many stain repellent finishes. Also used as: binder in non-woven fabrics to enhance dyeing; wetting agents to improve coverage and penetration of substances; achieve finish-on-yarn uniformity; water resistance; oil resistant coatings on textiles, leather, and other materials. These chemicals are persistent, bioaccumulative and poisonous to mammals.

EXPLANATION ON THE ACTION OF SUBSTANCES

PESTICIDES	pesticides are substances or mixtures of substances used to kill a pest. A pesticide may be a chemical substance, biological agent (such as a virus or bacteria), antimicrobial, disinfectant or device used against any pest. Although there are benefits to the use of pesticides, there are also drawbacks, such as potential toxicity to humans and animals. In textiles and apparel, these pesticides may be found in natural fibres, primarily cotton.
PHTHALATES	are a class of organic compounds added to plastics to increase flexibility. In textiles and apparel, phthalates can be associated with flexible plastic components, trims, screen and plastisol prints. Phthalates are reprotoxic and can cause birth defects and changes in hormone levels.
DIMETHYL FUMARATE	is used by producers as a biocide to kill moulds that may cause furniture or shoe leather to deteriorate during storage and transportation in a humid climate. Dimethyl fumarate (DMF) is a fungicide that manufacturers use for maritime transport and the storage of consumer goods. DMF can cause acute dermatitis, eczema, and general fatigue to the persons who have been in contact with this substance.
ALKYLPHENOLS (AP) AND ALKYPHENOL ETHOXYLATES (APEO)	NPEs/OPEs are included in the group of non-ionic surfactants called alkyl phenol ethoxylates (APEOs). NPEs and OPEs can degrade to NP and OP respectively. APEOs are used in detergents, scouring agents, wetting agents, softeners, emulsifier/dispersing agents for dyes and prints and as impregnating agents In leather tanning, APEO is used in de-greasing, finishing etc. In silk production for de-gumming. APEO could also be present in dyes and pigment preparations. Polyester padding and down/feather fillings are risky for APEO. These chemicals are liable to be toxic , persistent and to bioaccumulate.
BIOCIDES	are biologically active substances, and their toxic and biocidal nature enables them to kill or harm living things. Since biocides by nature are used to have detrimental effects on biological organisms, they are at the same time a serious threat to living organisms that were not intended to be controlled. Biocides have adverse effects on the nervous system when entering into the human body. They may irritate eyes, skin, and the respiratory system.
DI-METHYL FORMAMIDE	The primary use of dimethyl formamide is as a solvent with low evaporation rate. Dimethyl formamide is used in the production of acrylic and aramid fibers and plastics. DMF has been linked to cancer in humans, and it is thought to cause birth defects. In some sectors of industry women are banned from working with DMF.
DIOXINS AND FURANS	Dioxins are a made up of 75 polychlorinated compounds called chlorinated dibenzo-p-dioxins. Each dioxin has a different level of toxicity based on its structure and tissue absorption qualities. Furans are also polychlorinated compounds (135 different furans exist). Dioxins and furans are structurally and toxically similar. Dioxins/furans are common by-products of incomplete combustion (burning) of organics in a chlorine rich environment and are often associated with the production of pesticides, PVC, and other similar chlorinated chemicals. It is unlikely that dioxin and furan legislation will apply to apparel and textiles.
FLUORINATED GREENHOUSE GASES	Fluorocarbons are mainly used as substitutes for CFCs (Chlorofluorocarbons) and HCFCs (Hydro fluorocarbons), both of which are ozone depleting substances that the 1987 Montreal Protocol has progressively phased out of production. Fluorocarbons are mostly used as refrigerants in refrigerators and air-conditioners and as propellants in industrial aerosols. Other applications include foam-blowing, solvent cleaning and textile coating. Textiles coated with fluorocarbons provide good resistance to weathering, UV light aging, chemical and soil resistance. Treated textiles also give good water-proof and anti-pilling effect. Coated textiles.
POLYCHLORINATED BIPHENYLS (PCB"s) and POLYCHLORINATED TERPHENYLS (PCT"s)	are persistent organic pollutants and have entered the environment through both use and disposal. Polychlorinated biphenyls commonly known as PCBs are man made chemicals. These chlorinated oils have a low degree of reactivity. They are not flammable, have high electrical resistance, good insulating properties and are very stable even when exposed to heat and pressure. Uses for PCBs quickly expanded to include hydraulic fluids, casting wax, plasticizers, pigments, adhesives, fire-retardants; vapour suppressants to extend the kill-life of insecticides; coatings to render fabric flame-proof, rot-proof and water-repellent, lacquers, varnishes and paints.
POLYCYCLIC AROMATIC HYDROCARBONS (PAH'S)	are one of the most widespread organic pollutants. In addition to their presence in fossil fuels they are also formed by incomplete combustion of carbon-containing fuels such as wood, coal, diesel, fat, tobacco, or incense PAH contaminations have been found in rubber but also in various plastics.
POLYVINYLCHLORIDE (PVC)	is a widely used thermoplastic polymer. It can be made softer and more flexible by the addition of plasticizers, the most widely-used being phthalates. In this form, it is used in clothing and upholstery It is commonly used in coats, jackets, aprons and bags. The global phase-out of PVC is advocated because it is claimed that dioxin is produced as a byproduct of vinyl chloride manufacture and from incineration of waste PVC in domestic garbage.
VOLATILE ORGANICS (VOC's)	are organic chemical compounds that vaporize under normal conditions and enter the atmosphere. Common artificial VOCs include thinners and dry cleaning solvents.
pH VALUE	pH is a measure of the acidity or basicity of a solution. A solution whose pH is 7 is said to be neutral, which means that it is neither acidic nor basic. pH values that do not fall within the specified limits can cause skin irritation.

Information provided in this document is valid as of November 2016. Changes, modifications and/or actualizations will be notified from time to time, and will make part of this list as of such date.

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