

G-STAR RAW

MANUFACTURING
RESTRICTED SUBSTANCES LIST

VERSION 3.0 - FEBRUARY 2018

INTRODUCTION

Scope

This Manufacturing Restricted Substance List (MRSL) applies to all G-Star Raw C.V. suppliers. 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. G-Star Raw C.V. anticipates that suppliers will work closely with their chemical suppliers to ensure substances mentioned in this MRSL are not present in any of the chemical commercial products that are purchased from chemical suppliers. This MRSL is an important part of G-Star's Corporate Responsibility program and must be shared with all suppliers, sub-contractors and others involved in the production of G-Star products.

The following production processes are targeted by this document: Textile and synthetic leather, so as leather processing.

Background

G-Star Raw C.V. is a member of the Zero Discharge of Hazardous Chemicals Foundation (ZDHC) and committed to defined and develop a Manufacturing Restricted Substance List (MRSL) for the apparel and footwear industry. In doing so, brands recognized the value of addressing hazardous substances potentially used and discharged into the environment during manufacturing and related processes deep within our supply chain - not just those substances that could be present in finished products. In June 2014, the ZDHC brands achieved a significant milestone and published the first version of the ZDHC MRSL.

Purpose of the list

G-Star cares about consumers and the environment. Our suppliers are critical partners in our commitments in the area of consumer safety and environmental protection. The MRSL contains a list of chemical substances by CAS# that are subject to a usage ban.

The MRSL applies to chemicals used in the manufacturing of materials, components and finished products, which include solvents, cleaners, adhesives, paints, inks, detergents, dyes, colorants, auxiliaries and finishing agents used during raw material production, wet processing, maintenance, waste water treatment, sanitation and pest control. There should be no intentional use of the MRSL listed substances in facilities.

IMPORTANT

Threshold limit values on restricted substances in chemical formulations are in some cases substantially higher than limits on restricted substances in finished products. This is because restricted substances in finished products are almost always found in smaller concentrations than in the chemical formulations used to produce them. Chemical formulations are highly concentrated before being diluted upon application to textiles and other materials.

Note: The MRSL does not replace applicable national environmental or workplace safety restrictions. Worker exposure to the listed and other hazardous substances must not exceed occupational exposure limits and chemical formulations must comply with all applicable legal restriction, including any subsequent restrictions that establish stricter limits. The MRSL does not replace legal restrictions on hazardous substances in finished products (RSL requirements).

G-Star Raw C.V. advises you to communicate the MRSL requirements to raw material supplier, including sub-contractors and factories assembling or manufacturing garments and footwear. To support our goal of using MRSL compliant formulations, G-Star Raw C.V. also expects that material suppliers and factories will communicate with the chemical suppliers to ensure that listed substances are not present in chemical formulation above established limits.

Definitions

Chemical Substance

means a chemical element and its compounds in the natural state or obtained by any manufacturing process, including any additive necessary to preserve its stability and any impurity deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition.

Commercial Chemical Product

is a proprietary blend of several chemical substances or a reaction product used to create a 'trade name' or 'functional' product that is available for purchase from a chemical supplier. Note this document will not list commercial chemical products.

CAS - Chemical Abstract Service index number

It is a unique numeric identifier, designates only one substance, has no chemical significance, is a link to a wealth of information about a specific chemical substance.

It includes up to 9 digits which are separated into 3 groups by hyphens. The first part of the number, starting from the left, has up to 6 digits; the second part has 2 digits and the final part consists of a single check digit.

INTRODUCTION

Usage Ban

Chemical Products used for the manufacturing of articles (e.g. colorants) must not intentionally contain these substances or substances groups.

MRS� Creation Process

The MRS� includes relevant substances from the original 11 priority chemical groups along with additional substances discussed with qualified experts from the Zero Discharge of Hazardous Chemicals Technical Advisory Committee (ZDHC TAC). Several of the listed substances are regulation in finished products and have been successfully restricted for years. Though already restricted by ZDHC brands, their inclusion on the list keep it consistent with existing industry standards. Where possible, the content of the MRS� was peer-reviewed by independent third-party technical experts and industry associations related to the production of our key raw materials. Collaboration with leading technical experts allows to develop a MRS� that pragmatically represents progress and supports our long-term goal of zero discharge.

MRS� Instructions

Appendix I: MRS� for Textiles and Synthetic Leather Processing

This section applies to chemical formulations and substances used during the creation and wet processing of textile fibers and during the creation process and processing of synthetic leather.

Appendix II: MRS� for Natural Leather Processing

This section applies to chemical formulations and substances used throughout the production of natural leather, from raw hide to finished leather.

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G-STAR RAW
APPENDIX I: MRSL

FOR TEXTILES AND SYNTHETIC LEATHER PROCESSING

MRSL TEXTILES AND SYNTHETIC LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSL limit in ppm	Common Potential Use	Mill	Printer	CMT	Finish	Accessories
PHTHALATES											
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	Usage Ban for every single substance	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography Mass spectrometry (GC-MS)	sum of all phthalates 250ppm	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 sleeveings, Coatings, etc.	X	X	X	X
Dibutyl phthalate (DBP)	84-74-2										
Butylbenzyl phthalate (BBP)	85-68-7										
Di-isononyl phthalate (DINP)	28553-12-0 and 68515-48-0										
Di-isodecyl phthalate (DIDP)	26761-40-0 and 68515-49-1										
Di-n-octyl phthalate (DNOP)	117-84-0										
Di-isobutyl phthalate (DIBP)	84-69-5										
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)	68515-42-4										
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)	71888-89-6										
1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	84777-06-0										
Di-iso-pentyl phthalate (DIPP)	605-50-5										
n-Pentyl-isopentyl phthalate	776297-69-9										
Di-n-pentyl phthalate (DnPP)	131-18-0										
Bis(2-methoxyethyl) phthalate (DMEP)	117-82-8										
Di-n-hexyl phthalate (DHP)	84-75-3										
Dimethyl phthalate (DMP)	131-11-3										
Di-cyclohexyl phthalate (DCHP)	84-61-7										
Diethyl phthalate (DEP)	84-66-2										
Di-isooctyl phthalate (DIOP)	27554-26-3										
Dinonyl phthalate (DNP)	84-76-4										
Di-n-propyl phthalate (DPRP)	131-16-8										
1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	68515-50-4										

MRSL TEXTILES AND SYNTHETIC LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSL limit in ppm	Common Potential Use	Mill	Printer	CMT	Finish	Accessories
FLAME RETARDENTS											
Tris-(2,3-dibromopropyl)- phosphate (TRIS)	126-72-7	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography Mass spectrometry (GC-MS)	250ppm	Flame retardant chemicals potentially used in clothing and tent fabric (PU clothings) to meet safety standards.	X	X	X	X
Tris - (aziridiny) - phosphineoxide (TEPA)	5455-55-1					250ppm					
Polybromobiphenyls (PBB)	59536-65-1					250ppm					
Tris-(2-chloroethyl)-phosphate (TCEP)	115-96-8					250ppm					
Bis(2,3-dibromopropyl) phosphate (BBP)	5412-25-9					250ppm					
Bis(2,3-dibromopropylether) of tetrabromobisphenol (BDBPT)	21850-44-2					250ppm					
Decabromodiphenyl Ether (DecaBDE)	1163-19-5					250ppm					
2,2-Bis(bromomethyl)-1,3-propanediol	3296-90-0					250ppm					
Bis(2,3-dibromopropyl)phosphate	5412-25-9					250ppm					
Hexabromocyclododecane (HBCDD)	25637-99-4					250ppm					
	3194-55-6					250ppm					
	134237-50-6					250ppm					
	134237-51-7					250ppm					
	134237-52-8"					250ppm					
Polybrominated diphenyl ethers (PBDE)	Several					250ppm					
Tetrabromodiphenyl ether (TetraBDE)	40088-47-9					250ppm					
Pentabromodiphenyl ether (PentaBDE)	32534-81-9					250ppm					
Hexabromodiphenyl ether (HexaBDE)	36483-60-0					250ppm					
Heptabromodiphenyl ether (HeptaBDE)	68928-80-3					250ppm					
Octabromodiphenyl ether (OctaBDE)	32536-52-0					250ppm					
Nonabromodiphenyl ether (NonaBDE)	63936-56-1					250ppm					
Decabromodiphenyl ether (DecaBDE)	1163-19-5					250ppm					
Tetrabromobisphenol A	79-94-7					250ppm					
Trimethyl phosphate	512-56-1	250ppm									
Tri-o-cresyl phosphate	78-30-8	250ppm									

MRSL TEXTILES AND SYNTHETIC LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSL limit in ppm	Common Potential Use	Mill	Printer	CMT	Finish	Accessories					
AZO DYES WHICH BY REDUCTIVE CLEAVAGE MAY RELEASE ONE OR MORE ARYLAMINES																
Biphenyl-4-ylamin, 4-aminobiphenyl xenylamine	92-67-1	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Liquid Chromatography (LC); Gas Chromatography (GS) EN ISO 17234-1 EN ISO 17234-2	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-methoxy-m-phenylenediamine	615-05-4															
4,4'-methylenedianiline 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											X	X		X	X
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'-methylene-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-xylydine	95-68-1															
2,6-xylydine	87-62-7															
2-Naphthylamine	91-59-8															

MRSLS TEXTILES AND SYNTHETIC LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSLS limit in ppm	Common Potential Use	Mill	Printer	CMT	Finish	Accessories
ORGANOTIN COMPOUNDS											
Monomethyltin compounds (MMT)	Several	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography Mass spectrometry (GC-MS); Low Resolution Mass spectrometry (LRMS)	20ppm (Exception 100ppm for PU based thickeners used at <20% loading)	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.	X	X	X	
Monobutyltin compounds (MBT)	Several										
Monophenyltin compounds (MPHT)	Several										
Monooctyltin compounds (MOT)	Several										
Dimethyltin compounds (DMT)	Several										
Dibutyltin compounds (DBT)	Several										
Diphenyltin compounds (DPHT)	Several										
Dioctyltin compounds (DOT)	Several										
Trimethyltin compounds (TMT)	Several										
Tripropyltin compounds (TPT)	Several										
Tributyltin compounds (TBT)	Several										
Triphenyltin compounds (TPHT)	Several										
Trioctyltin compounds (TOT)	Several										
Tetraethyltin compounds (TeET)	Several										
Tetrabutyltin compounds (TTBT)	Several										
Tetraoctyltin compounds (TTOT)	Several										
Tricyclohexyltin compounds (TCyHT)	Several										

MRS� TEXTILES AND SYNTHETIC LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRS� limit in ppm	Common Potential Use	Mill	Printer	CMT	Finish	Accessories	
CHLOROBENZENES AND CHLOROTOLUENES												
Dichlorobenzenes, all isomers	Several	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography Mass spectrometry (GC-MS)	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.	X	X	X	X	X	
1,2-Dichlorobenzene	95-50-1											1000ppm
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											
a-Chlorotoluene	100-44-7											
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											

MRS� TEXTILES AND SYNTHETIC LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRS� limit in ppm	Common Potential Use	Mill	Printer	CMT	Finish	Accessories	
CHLOROBENZENES AND CHLOROTOLUENES (CONT.)												
Trichlorotoluenes, all isomers	Several	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography Mass spectrometry (GC-MS)	Sum of all other isomers = 200ppm	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.	X	X	X	X	X
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											
a,a,a-Trichlorotoluene	98-07-7											
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											
a,a,a,4-Tetrachlorotoluene	5216-25-1											
Pentachlorotoluene	877-11-2											
Monochlorobenzene	108-90-7											

MRS� TEXTILES AND SYNTHETIC LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSL limit in ppm	Common Potential Use	Mill	Printer	CMT	Finish	Accessories	
CHLORINATED/HALOGENATED SOLVENTS												
1,2,3-Trichloropropane	96-18-4	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography Mass spectrometry (GC-MS)	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).	X	X	X	X	X	
1,2-Dichloroethane	107-06-2											5ppm
Pentachloroethane	76-01-7											5ppm
Chloroform	67-66-3											5ppm
Trichloroethane	79-00-5											5ppm
1,1,1-Trichloroethane	71-55-6											5ppm
1,1,1,2-Tetrachloroethane	630-20-6											5ppm
1,1,2,2-Tetrachloroethane	79-34-5											5ppm
Tetrachloroethylene	127-18-4											5ppm
Trichloroethylene	79-01-6											40ppm
Methylene chloride	75-09-2	5ppm										

MRSL TEXTILES AND SYNTHETIC LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSL limit in ppm	Common Potential Use	Mill	Printer	CMT	Finish	Accessories
CHLOROPHENOLS											
Tetrachlorophenol (TeCP)	25167-83-3	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography Mass spectrometry (GC-MS) EN ISO 17070	limit applicable for TeCP and PCP	Chlorophenols are polychlorinated compounds used as preservatives or pesticides. Pentachlorophenol (PCP) and Tetrachlorophenol (TeCP) are sometimes used to prevent mould and kill insects when growing cotton and when storing/ transporting fabrics. PCP/TeCP can also be used as a preservative in print pastes, and in certain disperse dyes..	X	X	X	X
Pentachlorophenol (PCP)	87-86-5										
2,3,5,6 - Tetrachlorophenol (TeCP)	935-95-5										
2,3,4,6 - Tetrachlorophenol (TeCP)	58-90-2										
2,3,4,5 - Tetrachlorophenol (TeCP)	4901-59-3										
2-Chlorophenol	95-57-8										
2,4-Dichlorophenol	120-83-2										
2,5-Dichlorophenol	583-78-8										
2,6-Dichlorophenol	87-65-0										
2,4,5-Trichlorophenol	95-95-4										
2,4,6-Trichlorophenol	88-06-2										
3,5-Dichlorophenol	591-35-5										
2,3-Dichlorophenol	576-24-9										
3,4-Dichlorophenol	95-77-2										
3-Chlorophenol	108-43-0										
4-Chlorophenol	106-48-9										
2,3,4-Trichlorophenol	15950-66-0										
2,3,5-Trichlorophenol	933-78-8										
3,4,5-Trichlorophenol	609-19-8										
CHLORINATED PARAFFINS											
Short-chain chlorinated paraffins (SCCP)	85535-84-8	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography Mass spectrometry (GC-MS)	50ppm	SCCP's: used as flame retardants, in plasticizers, paints and adhesives and for fat liquoring of leather. SCCP's may cause long-term adverse effects in the aquatic environment.	X	X	X	X

MRSL TEXTILES AND SYNTHETIC LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSL limit in ppm	Common Potential Use	Mill	Printer	CMT	Finish	Accessories		
HEAVY METALS													
Arsenic (As)	7440-38-2	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	ICP-OES - Inductively coupled plasma - optical emission spectrometry	50ppm	Arsenic and its compounds can be used in some preservatives, pesticides and defoliants for cotton.						
Cadmium (Cd)	7440-43-9					20ppm/50ppm for pigments	Cadmium 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.)						
Chromium (Cr VI)	18540-29-9					10ppm	Chromium is used in leather tanning and can be oxidised into Cr6+.	X	X		X	X	
Lead (Pb)	7439-92-1					100ppm	In apparel and footwear, lead may be associated with plastics, paints, inks, pigments, surface coatings and metal components.						
Mercury (Hg)	7439-97-6					2ppm/25ppm for pigments	Mercury compounds can be present in pesticides and can be found as contamination in caustic soda (NaOH). Mercury compounds can be used in paints (e.g. surface paints on zippers and buttons).						
ALKYLPHENOLS (AP) AND ALKYLPHENOL ETHOXYLATES (APEO)													
Nonylphenols (NP)	25154-52-3 104-40-5 11066-49-2 84852-15-3	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Liquid Chromatography Mass spectrometry (LC-MS); Gas Chromatography Mass spectrometry (GC-MS)	250ppm	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					250ppm							
Nonylphenoethoxylates (NPEO)	9016-45-9 26027-38-3 37205-87-1 127087-87-0 68412-53-3 68412-54-4					500ppm	X	X	X	X	X		
Octylphenolsethoxyates (OPEO)	9036-19-5 38987-90-6 9002-93-1					500ppm							

MRS� TEXTILES AND SYNTHETIC LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRS� limit in ppm	Common Potential Use	Mill	Printer	CMT	Finish	Accessories				
PERFLUORINATED CHEMICALS															
Perfluorooctanesulfonates (PFOS)	1763-23-1	Usage Ban alternative water repellent finishing has to be used	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Liquid Chromatography Mass spectrometry (LC-MS)	1ppm	Perfluorooctane sulpionate (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.								
PFHxA	307-27-4					1ppm									
Perfluorooctane acids (PFOA)	335-67-1					2ppm									
1H,1H,2H,2H-Perfluorooctylacrylate (6:2 FTA)	17527-29-6					Not Detected						Perfluorinated chemicals (PFC's) can be used as impregnation agents and cleaning products. PFC's are persistent, bioaccumulative and poisonous and possibly carcinogenic.			
1H,1H,2H,2H-Perfluorodecylacrylate (8:2 FTA)	27905-45-9														
1H,1H,2H,2H-Perfluorododecylacrylate (10:2 FTA)	17741-60-05												X	X	X
1H,1H,2H,2H-Perfluoro-1-hexanol (4:2 FTOH)	2043-47-2														
1H,1H,2H,2H-Perfluoro-1-oktanol (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														

MRSL TEXTILES AND SYNTHETIC LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSL limit in ppm	Common Potential Use	Mill	Printer	CMT	Finish	Accessories
POLYCYCLIC AROMATIC HYDROCARBONS (PAH'S)											
Benzo(a)pyrene	50-32-8	Usage Ban	ADDITIONALLY Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography Mass spectrometry (GC-MS)	20ppm	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.	X	X	X	X	X
Benzo(e)pyrene	192-97-2										
Benzo(a)anthracene	56-55-3										
Chrysene	218-01-9										
Benzo(b)fluoranthene	205-99-2										
Benzo(j)fluoranthene	205-82-3										
Benzo(k)fluoranthene	207-08-9										
Dibenzo(a,h)anthracene	53-70-3										
Acenaphthene	83-32-9										
Acenaphthylene	208-96-8										
Anthracene	120-12-7										
Benzo(ghi)perylene	191-24-2										
Fluoranthene	206-44-0										
Fluorene	86-73-7										
Indeno(1,2,3-cd)pyrene	193-39-5										
Phenanthrene	85-01-8										
Pyrene	129-00-0										
Naphthalene	91-20-3										
ALLERGENIC DISPERSE DYES											
C.I. Disperse Blue 106	12223-01-7	Usage Ban	ADDITIONALLY Declaration needed from chemical supplier/ raw material supplier	Liquid Chromatography (LC)	250ppm	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.	X		X		
C.I. Disperse Blue 124	61951-51-7										
C.I. Disperse Blue 35	12222-75-2 56524-77-7										
C.I. Disperse Orange 3	730-40-5										
C.I. Disperse Orange 37/59/76	12223-33-5 13301-61-6 51811-42-8										
C.I. Disperse Red 1	2872-52-8										
C.I. Disperse Blue 3	2475-46-9										
C.I. Disperse Blue 7	3179-90-6										
C.I. Disperse Blue 26	3860-63-7										

MRSL TEXTILES AND SYNTHETIC LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSL limit in ppm	Common Potential Use	Mill	Printer	CMT	Finish	Accessories
ALLERGENIC DISPERSE DYES (CONT.)											
C.I. Disperse Blue 102	12222-97-8	Usage Ban	ADDITIONALLY Declaration needed from chemical supplier/ raw material supplier	Liquid Chromatography (LC)	250ppm	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.	X		X		X
C.I. Disperse Brown 1	23355-64-8				250ppm						
C.I. Disperse Orange 1	2581-69-3				250ppm						
C.I. Disperse Red 11	2872-48-2				250ppm						
C.I. Disperse Red 17	3179-89-3				250ppm						
C.I. Disperse Yellow 1	119-15-3				250ppm						
C.I. Disperse Yellow 9	6373-73-5				250ppm						
C.I. Disperse Yellow 39	12236-29-2				250ppm						
C.I. Disperse Yellow 49	54824-37-2				250ppm						
CARCINOGENIC DYES											
C.I. Acid Red 26	3761-53-3	Usage Ban	ADDITIONALLY Declaration needed from chemical supplier/ raw material supplier	Liquid Chromatography (LC)	250ppm	Most of these substances are regulated and should no longer be used for dyeing of textiles	X		X		X
C.I. Basic Red 9	569-61-9				250ppm						
C.I. Direct Black 38	1937-37-7				250ppm						
C.I. Direct Blue 6	2602-46-2				250ppm						
C.I. Direct Red 28	573-58-0				250ppm						
C.I. Disperse Blue 1	2475-45-8				250ppm						
C.I. Disperse Yellow 3	2832-40-8				250ppm						
C.I. Basic Violet 14	632-99-5				250ppm						
C.I. Disperse orange 11	82-28-0				250ppm						
Basic Green 4	Several				250ppm						
Malachit green	10309-95-2				250ppm						
Malachit green chloride	569-64-2				250ppm						
Malachit green oxalate	2437-29-8				250ppm						
Pigment Black 25	68186-89-0				250ppm						
Pigment Yellow 34	1344-37-2				250ppm						
Pigment Yellow 157	68610-24-2				250ppm						
Pigment Red 104	12656-85-8				250ppm						

MRSL TEXTILES AND SYNTHETIC LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSL limit in ppm	Common Potential Use	Mill	Printer	CMT	Finish	Accessories
COLOURANTS BANNED FOR OTHER REASONS											
Basic Blue 26	2580-56-5	Usage Ban	ADDITIONALLY Declaration needed from chemical supplier/ raw material supplier	Liquid Chromatography (LC)	250ppm	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.	X		X		X
Direct Yellow 1	6472-91-9				250ppm						
Disperse Yellow 23	6250-23-3				250ppm						
Disperse Orange 149	85136-74-9				250ppm						
Navy Blue	118685-33-9				250ppm						
GLYCOLS											
Bis(2-methoxyethyl)-ether	111-96-6	Usage Ban	ADDITIONALLY Declaration needed from chemical supplier/ raw material supplier	High Performance Liquid Chromatography (HPLC) Liquid Chromatography Mass spectrometry	50ppm	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).	X	X	X	X	X
2-ethoxyethanol	110-80-5				50ppm						
2-ethoxyethyl acetate	111-15-9				50ppm						
Ethylene glycol dimethyl ether	110-71-4				50ppm						
2-methoxyethanol	109-86-4				50ppm						
2-Methoxy-1-propanol	1589-47-5				50ppm						
2-methoxyethylacetate	110-49-6				50ppm						
2-methoxypropylacetate	70657-70-4				50ppm						
Triethylene glycol dimethyl ether	112-49-2				50ppm						

MRSL TEXTILES AND SYNTHETIC LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSL limit in ppm	Common Potential Use	Mill	Printer	CMT	Finish	Accessories
OTHER SOLVENTS/VOLATILE ORGANIC COMPOUNDS (VOC)											
Xylene	1330-20-7	Usage Ban	ADDITIONALLY Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography Mass spectrometry (GC-MS)	500ppm	These volatile organic compounds should not be used in textile auxiliary chemical preparations. They are associated with solvent-based porcesses like solvent-based PU coatings and glues/adhesives. They should not be used for any kind of facility cleaning or post-cleaning.	X	X	X	X	X
Cresol, all isomers	1319-77-3										
o-cresol	95-48-7										
p-cresol	106-44-5										
m-cresol	108-39-4										
Benzene	71-43-2	50ppm									
POLYVINYLCHLORIDE (PVC)											
Polyvinylchloride	9002-86-2	Usage Ban	ADDITIONALLY Declaration needed from chemical supplier/ raw material supplier	Attenuated total reflection Infrared spectroscopy (ATR-FT IR)	ND	The use of PVC is voluntarily restricted because it is claimed that dioxins are produced as a byproduct of vinyl chloride manufacture and from burning of waste PVC.	X	X	X	X	X

G-STAR RAW
APPENDIX II: MRSL

FOR NATURAL LEATHER PROCESSING

MRS� FOR NATURAL LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRS� limit in ppm	Common Potential Use	Leather
PHTHALATES							
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	Usage Ban for every single substance	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography Mass spectrometry (GC-MS)	sum of all phthalates 250ppm	X
Dibutyl phthalate (DBP)	84-74-2						
Butylbenzyl phthalate (BBP)	85-68-7						
Di-isononyl phthalate (DINP)	28553-12-0 and 68515-48-0						
Di-isodecyl phthalate (DIDP)	26761-40-0 and 68515-49-1						
Di-n-octyl phthalate (DNOP)	117-84-0						
Di-isobutyl phthalate (DIBP)	84-69-5						
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)	68515-42-4						
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)	71888-89-6						
1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	84777-06-0						
Di-iso-pentyl phthalate (DIPP)	605-50-5						
n-Pentyl-isopentyl phthalate	776297-69-9						
Di-n-pentyl phthalate (DnPP)	131-18-0						
Bis(2-methoxyethyl) phthalate (DMEP)	117-82-8						
Di-n-hexyl phthalate (DHP)	84-75-3						
Dimethyl phthalate (DMP)	131-11-3						
Di-cyclohexyl phthalate (DCHP)	84-61-7						
Diethyl phthalate (DEP)	84-66-2						
Di-isooctyl phthalate (DIOP)	27554-26-3						
Dinonyl phthalate (DNP)	84-76-4						
Di-n-propyl phthalate (DPRP)	131-16-8						
1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	68515-50-4						
<p>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.</p> <p>Polymeric coatings for leather finishing, dedusting agents in colourants, fat liquors and greases could be a source for phthalates in formulations for leather processing.</p>							

MRSLS FOR NATURAL LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSLS limit in ppm	Common Potential Use	Leather		
FLAME RETARDENTS									
Tris-(2,3-dibromopropyl)- phosphate (TRIS)	126-72-7	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography Mass spectrometry (GC-MS)	250ppm	These flame retardant chemicals can potentially be used in leather processing for technical and industrial purposes (e.g. drive belts) and upholstery leather for trains and planes. The mentioned substances shall no longer be used in apparel and footwear.	X	
Tris - (aziridiny) - phosphineoxide (TEPA)	5455-55-1								250ppm
Polybromobiphenyls (PBB)	59536-65-1								250ppm
Tris-(2-chloroethyl)-phosphate (TCEP)	115-96-8								250ppm
Bis(2,3-dibromopropyl) phosphate (BBP)	5412-25-9								250ppm
Bis(2,3-dibromopropylether) of tetrabromobisphenol (BDBPT)	21850-44-2								250ppm
Decabromodiphenyl Ether (DecaBDE)	1163-19-5								250ppm
2,2-Bis(bromomethyl)-1,3-propanediol	3296-90-0								250ppm
Bis(2,3-dibromopropyl)phosphate	5412-25-9								250ppm
Hexabromocyclododecane (HBCDD)	25637-99-4 3194-55-6 134237-50-6 134237-51-7 134237-52-8								250ppm
Polybrominated diphenyl ethers (PBDE)	Several								250ppm
Tetrabromodiphenyl ether (TetraBDE)	40088-47-9								250ppm
Pentabromodiphenyl ether (PentaBDE)	32534-81-9								250ppm
Hexabromodiphenyl ether (HexaBDE)	36483-60-0								250ppm
Heptabromodiphenyl ether (HeptaBDE)	68928-80-3								250ppm
Octabromodiphenyl ether (OctaBDE)	32536-52-0								250ppm
Nonabromodiphenyl ether (NonaBDE)	63936-56-1								250ppm
Decabromodiphenyl ether (DecaBDE)	1163-19-5								250ppm
Tetrabromobisphenol A	79-94-7								250ppm
Trimethyl phosphate	512-56-1								250ppm
Tri-o-cresyl phosphate	78-30-8	250ppm							

MRSL FOR NATURAL LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSL limit in ppm	Common Potential Use	Leather		
AZO DYES WHICH BY REDUCTIVE CLEAVAGE MAY RELEASE ONE OR MORE ARYLAMINES									
Biphenyl-4-ylamin, 4-aminobiphenyl xenylamine	92-67-1	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Liquid Chromatography (LC); Gas Chromatography (GS) EN ISO 17234-1 EN ISO 17234-2	150ppm	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.	X	
Benzidine	92-87-5								150ppm
4-chloro-o-toluidine	95-69-2								150ppm
2-naphtylamine	91-59-8								150ppm
o-aminoazotoluene, 4-amino-2',3'-dimethylazobenzene 4-o-tolylazo-otoluidine	97-56-3								150ppm
5-nitro-o-toluidine	99-55-8								150ppm
4-chloroaniline	106-47-8								150ppm
4-methoxy-m-phenylenediamine	615-05-4								150ppm
4,4'-methylenedianiline 4,4'-diaminodiphenylmethane	101-77-9								150ppm
3,3'-dichlorobenzidine 3,3'-dichlorobiphenyl-4,4'-ylenediamine	91-94-1								150ppm
3,3-dimethoxybenzidine o-dianisidine	119-90-4								150ppm
3,3-dimethylbenzidine, 4,4'-bi-o-toluidine	119-93-7								150ppm
4,4'-methylenedi-o-toluidine	838-88-0								150ppm
6-methoxy-m-toluidine p-cresidine	120-71-8								150ppm
4,4'-methylene-bis-(2-chloro-aniline) 2,2'-dichloro-4,4'-ethylenedianiline	101-14-4								150ppm
4,4'-oxydianiline	101-80-4								150ppm
4,4'-thiodianiline	139-65-1								150ppm
o-toluidine, 2-aminotoluene	95-53-4								150ppm
4-methyl-m-phenylenediamine	95-80-7								150ppm
2,4,5-trimethylaniline	137-17-7								150ppm
o-anisidine (2-methoxyanilin)	90-04-0								150ppm
4-amino azobenzene	60-09-3								150ppm
2,4-xylydine	95-68-1								150ppm
2,6-xylydine	87-62-7								150ppm
2-Naphtylamine	91-59-8								150ppm

MRSL FOR NATURAL LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSL limit in ppm	Common Potential Use	Leather
ORGANOTIN COMPOUNDS							
Monomethyltin compounds (MMT)	Several	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography (GS) EN ISO 17234-1 EN ISO 17234-2	5ppm	x
Monobutyltin compounds (MBT)	Several						
Monophenyltin compounds (MPHT)	Several						
Monooctyltin compounds (MOT)	Several						
Dimethyltin compounds (DMT)	Several						
Dibutyltin compounds (DBT)	Several						
Diphenyltin compounds (DPhT)	Several						
Dioctyltin compounds (DOT)	Several						
Trimethyltin compounds (TMT)	Several						
Tripropyltin compounds (TPT)	Several						
Tributyltin compounds (TBT)	Several						
Triphenyltin compounds (TPHT)	Several						
Trioctyltin compounds (TOT)	Several						
Tetraethyltin compounds (TeET)	Several						
Tetrabutyltin compounds (TTBT)	Several						
Tetraoctyltin compounds (TTOT)	Several						
Tricyclohexyltin compounds (TCyHT)	Several						

MRS� FOR NATURAL LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRS� limit in ppm	Common Potential Use	Leather
CHLOROBENZENES AND CHLOROTOLUENES							
Dichlorobenzenes, all isomers	Several	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography Mass spectrometry (GC-MS)	Chlorobenzenes and Chlorotoluenes can be used for degreasing sheep and pig skins. They can also be used as solvents (e.g. in chemical synthesis).	X
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						
a-Chlorotoluene	100-44-7						
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						

MRS� FOR NATURAL LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRS� limit in ppm	Common Potential Use	Leather	
CHLOROBENZENES AND CHLOROTOLUENES (CONT.)								
Trichlorotoluenes, all isomers	Several	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography Mass spectrometry (GC-MS)	Sum of all other isomers = 200ppm	Chlorobenzenes and Chlorotoluenes can be used for degreasing sheep and pig skins. They can also be used as solvents (e.g. in chemical synthesis).	X
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							
a,a,a-Trichlorotoluene	98-07-7							
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							
a,a,a,4-Tetrachlorotoluene	5216-25-1							
Pentachlorotoluene	877-11-2							
Monochlorobenzene	108-90-7							

MRSL FOR NATURAL LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSL limit in ppm	Common Potential Use	Leather
CHLORINATED/HALOGENATED SOLVENTS							
1,2,3-Trichloropropane	96-18-4	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography Mass spectrometry (GC-MS)	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).	X
1,2-Dichloroethane	107-06-2						
Pentachloroethane	76-01-7						
Chloroform	67-66-3						
Trichloroethane	79-00-5						
1,1,1,2-Tetrachloroethane	630-20-6						
1,1,1,2-Tetrachloroethane	79-34-5						
1,1,1-Trichloroethane	71-55-6						
Tetrachloroethylene	127-18-4						
Trichloroethylene	79-01-6						
Methylene chloride	75-09-2				5ppm		

MRSL FOR NATURAL LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSL limit in ppm	Common Potential Use	Leather	
CHLOROPHENOLS								
Tetrachlorophenol (TeCP)	25167-83-3	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography Mass spectrometry (GC-MS) EN ISO 17070	limit applicable for TeCP and PCP Sum of all 50ppm	Chlorophenols are polychlorinated compounds used as preservatives or pesticides. Pentachlorophenol (PCP) and Tetrachlorophenol (TeCP) have been used in the past to prevent mould when storing/transporting raw hides and leather. They are regulated and shall not be used.	
Pentachlorophenol (PCP)	87-86-5							
2,3,5,6 - Tetrachlorophenol (TeCP)	935-95-5							
2,3,4,6 - Tetrachlorophenol (TeCP)	58-90-2							
2,3,4,5 - Tetrachlorophenol (TeCP)	4901-59-3							
2-Chlorophenol	95-57-8							
2,4-Dichlorophenol	120-83-2							
2,5-Dichlorophenol	583-78-8							
2,6-Dichlorophenol	87-65-0							
2,4,5-Trichlorophenol	95-95-4							
2,4,6-Trichlorophenol	88-06-2							
3,5-Dichlorophenol	591-35-5							
2,3-Dichlorophenol	576-24-9							
3,4-Dichlorophenol	95-77-2							
3-Chlorophenol	108-43-0							
4-Chlorophenol	106-48-9							
2,3,4-Trichlorophenol	15950-66-0							
2,3,5-Trichlorophenol	933-78-8							
3,4,5-Trichlorophenol	609-19-8							
CHLORINATED PARAFFINS								
Short-chain chlorinated paraffins (SCCP)	85535-84-8	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	GC-ECNI-MS Gas Chromatography electron capture negative ion-mass spectrometry EN ISO 18219	250ppm	SCCP's: used as flame retardants, in plasticizers, paints and adhesives and for fat liquoring of leather. SCCP's may cause long-term adverse effects in the aquatic environment.	X

MRSL FOR NATURAL LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSL limit in ppm	Common Potential Use	Leather	
HEAVY METALS								
Arsenic (As)	7440-38-2	Usage Ban	Zero Discharge	Declaration needed from chemical supplier/ raw material supplier	ICP-OES - Inductively coupled plasma - optical emission spectrometry AAS - Atomic Absorption Spectroscopy Cr (III) Tanning Agents can be monitored for Cr (VI) EN ISO 17075 (current use) ISO/DIS 19071 (draft)	Arsenic and its compounds can be used in some preservatives, pesticides and defoliants for cotton. Arsenic is not a typical residue in leather chemicals.	X	
Cadmium (Cd)	7440-43-9					20ppm/50ppm for pigments		Cadmium 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.)
Chromium (Cr VI)	18540-29-9					10ppm		The two-bath process for tanning using potassium dichromate (VI) is no longer used by the leather industry. Potassium dichromate (VI) and other chromium VI compounds are banned and chromium VI residues in chromium (III) tanning agents are restricted.
Lead (Pb)	7439-92-1					100ppm		In apparel and footwear, lead may be associated with plastics, paints, inks, pigments, surface coatings and metal components.
Mercury (Hg)	7439-97-6					2ppm/25ppm for pigments		Mercury compounds can be present in pesticides and can be found as contamination in caustic soda (NaOH). Mercury compounds can be used in paints (e.g. surface paints on zippers and buttons). Mercury is not a typical residue in leather chemicals.

MRSL FOR NATURAL LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSL limit in ppm	Common Potential Use	Leather
ALKYLPHENOLS (AP) AND ALKYPHENOL ETHOXYLATES (APEO)							
Nonylphenols (NP)	25154-52-3 104-40-5 11066-49-2 84852-15-3	Usage Ban	Zero Discharge Declaration needed from chemical supplier/ raw material supplier	Liquid Chromatography Mass spectrometry (LC-MS); Gas Chromatography Mass spectrometry (GC-MS) EN ISO 18219-1 EN ISO 18219-2	250ppm	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. NP and OP are not used by the leather industry, but could be present as contaminants.	X
Octylphenols (OP)	27193-28-8 140-66-9 1806-26-4				250ppm		
Nonylphenoethoxylates (NPEO)	9016-45-9 26027-38-3 37205-87-1 68412-54-4 127087-87-0 68412-53-3				500ppm		
Octylphenolsethoxylates (OPEO)	9036-19-5 38987-90-6 9002-93-1				500ppm		
PERFLUORINATED CHEMICALS							
Perfluorooctanesulfonates (PFOS)	1763-23-1	Usage Ban	Zero Discharge Declaration needed from chemical supplier/ raw material supplier	Liquid Chromatography Mass spectrometry (LC-MS)	1ppm	Perfluorooctane sulpionate (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.	X
PFHxA	307-27-4				1ppm		
Perfluorooctane acids (PFOA)	335-67-1				2ppm		
1H,1H,2H,2H-Perfluorooctylacrylate (6:2 FTA)	17527-29-6				ND		
1H,1H,2H,2H-Perfluorodecylacrylate (8:2 FTA)	27905-45-9				ND		
1H,1H,2H,2H-Perfluorododecylacrylate (10:2 FTA)	17741-60-05				ND		
1H,1H,2H,2H-Perfluoro-1-hexanol (4:2 FTOH)	2043-47-2				ND		
1H,1H,2H,2H-Perfluoro-1oktanol (6:2 FTOH)	647-42-7				ND		
1H,1H,2H,2H-Perfluoro-1-decanol (8:2 FTOH)	678-39-7				ND		
1H,1H,2H,2H-Perfluoro-1-dodecanol (10:2 FTOH)	865-86-1	ND					

MRSL FOR NATURAL LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSL limit in ppm	Common Potential Use	Leather
POLYCYCLIC AROMATIC HYDROCARBONS (PAH'S)							
Benzo(a)pyrene	50-32-8	Usage Ban	ADDITIONALLY Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography Mass spectrometry (GC-MS)	20ppm	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.	X
Benzo(e)pyrene	192-97-2						
Benzo(a)anthracene	56-55-3						
Chrysene	218-01-9						
Benzo(b)fluoroanthene	205-99-2						
Benzo(j)fluoroanthene	205-82-3						
Benzo(k)fluoroanthene	207-08-9						
Dibenzo(a,h)anthracene	53-70-3						
Acenaphthene	83-32-9						
Acenaphthylene	208-96-8						
Antracene	120-12-7						
Benzo(ghi)perylene	191-24-2						
Fluoranthene	206-44-0						
Fluorene	86-73-7						
Indeno(1,2,3-cd)pyrene	193-39-5						
Phenanthrene	85-01-8						
Pyrene	129-00-0						
Naphthalene	91-20-3			Gas Chromatography Mass spectrometry (GC-MS) Liquid Chromatography Mass spectrometry (LC-MS)	300ppm	In the leather chemical industry, naphthalene is used as raw material for manufacture of synthetic tanning agents (syntans) and for manufacture of active substances in dispersing agents used during leather processing.	
ALLERGENIC DISPERSE DYES							
Disperse dyes have no applicability to leather processing.							

MRSL FOR NATURAL LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSL limit in ppm	Common Potential Use	Leather
CARCINOGENIC DYES							
C.I. Acid Red 26	3761-53-3	Usage Ban	ADDITIONALLY Declaration needed from chemical supplier/ raw material supplier	Liquid Chromatography Mass spectrometry (LC-MS)	250ppm	Most of these substances are regulated and should no longer be used for dyeing of leather.	X
C.I. Basic Red 9	569-61-9				250ppm		
C.I. Direct Black 38	1937-37-7				250ppm		
C.I. Direct Blue 6	2602-46-2				250ppm		
C.I. Direct Red 28	573-58-0				250ppm		
C.I. Disperse Blue 1	2475-45-8				250ppm		
C.I. Disperse Yellow 3	2832-40-8				250ppm		
C.I. Basic Violet 14	632-99-5				250ppm		
C.I. Disperse orange 11	82-28-0				250ppm		
Basic Green 4	Several				250ppm		
Malachit green	10309-95-2				250ppm		
Malachit green chloride	569-64-2				250ppm		
Malachit green oxalate	2437-29-8				250ppm		
Pigment Black 25	68186-89-0				250ppm		
Pigment Yellow 34	1344-37-2				250ppm		
Pigment Yellow 157	68610-24-2	250ppm					
Pigment Red 104	12656-85-8	250ppm					
COLOURANTS BANNED FOR OTHER REASONS							
Navy Blue	118685-33-9	Usage Ban	ADDITIONALLY Declaration needed from chemical supplier/ raw material supplier	Liquid Chromatography (LC)	250ppm	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.	X

MRSLS FOR NATURAL LEATHER PROCESSING

Substance	CAS number	Criteria	Guidelines	Test Method	MRSLS limit in ppm	Common Potential Use	Leather
GLYCOLS							
Bis(2-methoxyethyl)-ether	111-96-6	Usage Ban	ADDITIONALLY Declaration needed from chemical supplier/ raw material supplier	High Performance Liquid Chromatography (HPLC) Liquid Chromatography Mass-spectrometry	50ppm	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).	X
2-ethoxyethanol	110-80-5				50ppm		
2-ethoxyethyl acetate	111-15-9				50ppm		
Ethylene glycol dimethyl ether	110-71-4				50ppm		
2-methoxyethanol	109-86-4				1000ppm		
2-methoxyethylacetate	110-49-6				50ppm		
2-methoxypropylacetate	70657-70-4				50ppm		
2-Methoxy-1-propanol	1589-47-5				50ppm		
Triethylene glycol dimethyl ether	112-49-2			50ppm			
OTHER SOLVENTS/VOLATILE ORGANIC COMPOUNDS (VOC)							
Cresol, all isomers	1319-77-3	Usage Ban	ADDITIONALLY Declaration needed from chemical supplier/ raw material supplier	Gas Chromatography Mass spectrometry (GC-MS)	500ppm	These volatile organic compounds should not be used in leather and 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.	X
o-cresol	95-48-7				500ppm		
p-cresol	106-44-5				500ppm		
m-cresol	108-39-4				500ppm		
Benzene	71-43-2				50ppm		

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Information provided in this document is valid as of February 2018. 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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