Alligo Group Chemical Requirements
Ver. 2025.1 – Textile & Leather

Introduction

This document contains information to suppliers (producers, importers and traders) regarding legal requirements and restricted substances in textiles, clothing, leather goods, shoes and similar products purchased by Alligo Group which will hereon in this document be referred to as Alligo.

The Alligo Chemical Requirements constitutes a part Alligo Supplier Agreement and is applicable to all orders and products delivered to Alligo. The supplier is obliged to inform all its sub-suppliers and subcontractors of the chemical requirements throughout the supply chain and enforce full implementation of the same.

For further information, comments or questions, please contact Alligo quality department at: info@swedol.se.

Legal Requirements

REACH – European Parliament and Council Regulation (EC) No 1907/2006

REACH is the European Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals. It entered into force in 2007, replacing the former legislative framework for chemicals in the EU. The main aims of REACH are to ensure a high level of protection for human health and the environment, including the promotion of alternative test methods.

REACH affects all EU-actors that professionally manufacture, import, sell, buy, distribute or use chemicals as such and in articles. Thus, Alligo require that all our suppliers comply with REACH and other EU legislation.

Registration

One of the requirements of REACH is that manufactures of chemicals and importers of chemicals and articles have a duty to register, for each legal entity, substances on their own, or in preparations that they produce or import in quantities over 1000 kg per year (per manufacturer/importer), unless the substances is exempt from registration. For importers of articles registration requirements apply to substances intentionally released from articles under certain conditions, in which case the article producer/importer is responsible for the registration.

Duty to Inform on Substances for Authorization and registration in the SCIP-database

All EU-actors that professionally manufacture, import, sell or distribute articles are legally obliged to inform their customer about the presence of a Candidate List substance of very high concern, SVHC-substance, in articles placed on the market.

Since 5 January 2021 all articles containing SVHC-substances must be registered in the SCIP-database established under the Waste Framework Directive 2008/98/EC.

All suppliers are requested to follow updated information on the website of the European Chemicals Agency (ECHA): http://ECHA.europa.eu.

The Candidate List (SVHC): https://echa.europa.eu/candidate-list-table

The Authorization List (Annex XIV): https://echa.europa.eu/authorisation-list

SCIP-database: https://echa.europa.eu/scip

Information required regarding products

- Any substances from the Candidate List (SVHC) present above 0.1% in articles (refers to any individual part of an article) delivered to Alligo shall be declared. Please list these substances by name, CAS RN and concentration (% or mg/kg).

- Articles containing SVHC-substances need to be registered in the SCIP-database. Please, provide us with the registration number, SCIP-number, for all relevant articles.

Information regarding products shall be sent to mikaela.johansson@alligo.com as well as your contact person in purchasing within Alligo.

CLP-Regulation (EC) No 1272/2008 including the amendments in Regulation (EU) 2024/2865

The Regulation on classification, labelling and packaging of substances and mixtures aligns existing EU legislation to the United Nations' Globally Harmonized System (GHS). CLP is legally binding across the Member States and directly applicable to all industrial sectors. It requires manufacturers, importers or downstream users of substances or mixtures to classify, label and package their hazardous chemicals appropriately before placing them on the market.

https://ec.europa.eu/growth/sectors/chemicals/legislation_en
https://echa.europa.eu/regulations/clp/understanding-clp

Biocidal products (BPR), Regulation (EU) 528/2012

The Biocidal Products Regulation concerns the placing on the market and use of biocidal products. This regulation aims to improve the functioning of the biocidal products market in the EU, while ensuring a high level of protection for humans and the environment. All biocidal products require an authorization before they can be placed on the market, and the active substances contained in that biocidal product must be previously approved.

https://echa.europa.eu/regulations/biocidal-products-regulation/understanding-bpr

Regulation (EU) 2025/40 on Packaging and packaging waste (PPW) repealing Directive 94/62/EC

Note that this regulation is repealing the old Directive 94/62/EC 18 months after the new regulation enters into force. Regulation (EU) 2025/40 was adopted to harmonize national measures concerning the management of packaging and packaging waste and to prevent or reduce its impact on the environment and cover the entire packaging life cycle.

http://ec.europa.eu/environment/waste/packaging/legis.htm

POPs, Regulation (EC) No 2019/1021

Persistent organic pollutants (POPs) are chemical substances that persist in the environment, bioaccumulate through the food web, and pose a risk of causing adverse effects to human health and the environment. This group of priority pollutants consists of pesticides (such as DDT), industrial chemicals (such as polychlorinated biphenyls, PCBs) and unintentional by-products of industrial processes (such as dioxins and furans).

http://ec.europa.eu/environment/chemicals/international_conventions/index_en.htm

Ozon-depletion, Regulation (EU) No 2024/590, repealing Regulation (EC) No 1005/2009

This Regulation lays down rules on the production, import, export, placing on the market, use, recovery, recycling, reclamation and destruction of substances that deplete the ozone layer.

https://eur-lex.europa.eu/eli/reg/2024/590/oj

Implementation

The supplier is fully liable for compliance with the requirements specified in this document. The supplier is advised to carry out their own risk assessments and self-reference tests of products and/or materials for chemicals content and other aspects as necessary, on their own expense.

Alligo will carry out due diligence testing to verify compliance. In case of non-compliance with the Chemical Requirements, appropriate actions need to be discussed with Alligo without delay. The supplier will be liable for all costs occurred related to a non-compliance due to negligence or carelessness.

Annex 1: Additional substances prohibited by Alligo not covered in the Chemicals guide below.

Annex 1

Additional substances which are not included in the chemicals guide below. They are a requirement from all Swedish public tenders within the textile area and must therefore be fulfilled. They should not be present in any articles covered by this document.

Substance	CAS number
Disperse dyestuff	
C.I. Disperse Yellow 23	6250-23-3
Basic (cationic) dyestuff	
C.I. Basic Green 4 (oxalate)	2437-29-8
C.I. Basic Green 4 (chloride)	569-64-2
Flame retardants	
Tris(1-aziridinyl)-phosphine oxide (TEPA) (*listed as no longer in use in the guide*)	545-55-1
tris[2-chloro-1-chloromethyl)ethyl] phosphate (TDCPP)	13674-87-8

Legal background

TEPA, CAS RN: 545-55-1 is restricted under REACH Regulation (EC) No 1907/2006 Annex XVII entry 7. Conditions below:

1. Shall not be used in textile articles, such as garments, undergarments and linen, intended to come into contact with the skin.

2. Articles not complying with paragraph 1 shall not be placed on the market.

January 2025

Main changes in the Textile Chemicals Guidance

A new POPs restriction for *UV-328* has been added under the heading ‘UV stabilisers’. UV-328 is also an SVHC and was already listed in the Chemicals guidance.

The limit value for impurities in the POPs restriction of *Hexabromocyclododecane (HBCD, HBCDD)* has been decreased to 75 ppm.

The POPs restriction of *PFOA, its salts and related compounds* now also applies to textiles for the protection of workers from dangerous liquids and this has been updated in the Chemicals guidance.

A new REACH restriction for *PFHxA (undecafluorohexanoic acid), its salts and PFHxA-related substances* has been added under the heading ‘PFAS - Highly fluorinated carboxylic acids (PFOA and related substances)’.

The following SVHC from November 2024 and January 2025 have been added:

- *Triphenyl phosphate (TPP)* has been added under the heading ‘Flame retardants/Plasticizers - Trisubstituted phosphates’
- *Tris(4-nonylphenyl, branched and linear) phosphite (TNPP)* has been added under the heading ‘Alkylphenol ethoxylates (APEO) and derivatives’.
- *Octamethyltrisiloxane (L3)* has been added under the heading ‘Siloxanes’.

The following standards have been added/updated:

- *prEN ISO 13144* for testing quinoline has been added.
- *prEN 17131-1* (textile) for testing the aprotic solvents DMAC and NMP has been added.
- *EN/TS 15968* for testing PFAS has been removed.

Minor clarifications and language corrections have been done to improve understandability.

CHEMICALS GUIDANCE

Information on authorization and restrictions of substances used in textile and leather processes and products

Edition: January 2025

The Swedish Chemical`s Group, RISE

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PREFACE

This guide is developed for the members of the Swedish Chemicals Group to facilitate for importing companies to comply with national and EU chemical legislation and recommendations in the fields of textiles, clothes, leather goods, shoes and packaging material. Many chemicals used throughout the textile manufacturing chain can be harmful for the environment, factory workers and consumers. Therefore, an increasing number of chemicals are being restricted and all importers and distributors are responsible for the articles they put on the EU market.

This guide has been put together by a team of experts at RISE and is updated twice per year. The guide covers EU regulated chemical substances affecting textile and leather products as well as national legislation in Europe. In addition, some restrictions from other countries have been added.

The distinguishing properties of the chemicals of concern and the processes in which they are used are described in the guide. Stipulated test equipment for analysis of restricted substances in products is given when available.

The guide is provided in several languages that can all be accessed through the Chemicals group's website. To facilitate communication, the contents on each page are identical in each linguistic version. The English version of this guide is preferential for interpretation.

EXPLANATORY SECTION

Word list

Required limit value:	Limit value as agreed in business sector and or by legal requirements. Note that limit value is measured in products. Weight percent shall be calculated from the weight of the whole product if nothing else is stated.
CAS RN:	Chemical abstract services registration number. CAS RN are given for specific defined substances.
Properties:	Human toxicological and Eco toxicological properties.
Use:	Identified uses on the market.
Comments:	Information on known alternatives and recommendations on how to avoid unwanted chemicals.
Detection limit:	Limit of detection (LOD). Lowest concentration the test equipment is able to detect. This can vary between different test laboratories. Note that detection limit is not relevant as required limit values for all substances as the background concentrations can be notably higher.
Legal background:	Current legal EU and national European frameworks and requirements.
Candidate list:	Substances listed on Candidate List of Substances of Very High Concern for authorization of the Regulation (EC) No 1907/2006 (REACH) are referred to as SVHC. These substances are covered by an information duty if the concentration is 0.1 weight-% (1000 mg/kg) or above in an article. Candidate list substances are also included in the French AGEC legislation (Décret n° 2022-748) implying additional information requirements (same concentration limit).
MADL:	Maximum Allowable Dose Levels. Safe harbor levels for chemicals causing reproductive toxicity in Proposition 65 in California.
NSRL:	No Significant Risk Levels. Safe harbor levels for cancer-causing chemicals in Proposition 65 in California.
Quantification limit:	Limit of quantification (LOQ). The smallest concentration of an analyte that can be reliably measured by an analytical procedure.
Test method:	Standardized test method if such exists. ISO/EN standards are prioritized over national or commercial standards. This guide does not normally list the date of the standard. Make sure that the latest available version of each standard is used. Test equipment if no standardized test method exists. Abbreviations of recommended test equipment are explained below. All substances in a chemical group may not be legally regulated, but still included as a chemical group in this guide. As it can distinguish between different laboratories which substances besides the legal restricted, they offer test for, this should be confirmed before ordering.

Packaging material:	According to Directive (EC) No 94/62/EC of 20 December 1994 on packaging and packaging waste. The directive regulates substances in packaging material; meaning all products made of any materials of any nature to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods, from the producer to the user or the consumer.
POP:	Persistent Organic Pollutants (POPs) are organic chemical substances, which remain intact in the environment for exceptionally long periods of time.

Test equipment abbreviations

ANALYSIS OF ORGANIC COMPOUNDS

- **Gas chromatography: GC**
  Detectors used together with GC:
  - MS: Mass selective detector: GC-MS
  - DAD: Diode array detector: GC-DAD
  - ECD: Electron capture detector: GC-ECD

- **Liquid chromatography: LC**
  Note: Sometimes the abbreviation HPLC is used.
  It stands for High Performance Liquid Chromatography.
  Detectors used together with LC:
  - MS: Mass selective detector: LC-MS
  - DAD: Diode array detector: LC-DAD
  - ECD: Electron capture detector: LC-ECD
  - UV/VIS: Ultraviolet/visible spectrophotometric detector: LC-UV/VIS

ANALYSES OF METALS

- **Inductively Coupled Plasma Spectrometry: ICP**
  Detectors together with ICP:
  - OES: Optical emission spectrometer: ICP-OES
  - MS: Mass selective detector: ICP-MS
- **Atomic absorption spectrophotometer: AAS**

SCREENING ANALYSES OF ELEMENTS

- **X-ray fluorescence, XRF**

Relationship between units used in the guide

1000	mg/kg	equals	1000	ppm	(parts per million)
1000	mg/kg	equals	1 000 000	ppb	(parts per billion)
1000	mg/kg	equals	1 000 000	µg/kg	(microgram per kilogram)
1000	mg/kg	equals	0.1	%	(by weight)

Relationship between surface concentration and total concentration (relevant for the PFOS restrictions)

Surface concentration of the chemical [µg/m²]	Surface weight of the fabric [g/m²]		Total concentration of the chemical [ppb = µg/kg]
1	40	equals	25
2.5	100	equals	25
5	200	equals	25

Product and material categories concerned

All chemicals are not used in all materials. A general division into the categories listed below has therefore been made that may be applicable to several kinds of articles due to their material composition.

			
Textile Textile material, both natural and synthetic fibres	**Leather** Leather, both natural and leather imitation	**Accessories** Metal, plastics, rubber etc. used in e.g. buckles, buttons, jewellery and zippers.	**Packaging** Packaging material in accordance with the Packaging Directive 94/62/EC. Paper cardboard, plastic bags, tags, labels, plastic sleeves etc.

PROCESS CHEMICALS

Process chemicals are used in the manufacturing process of the textile and leather goods but have no function in the finished product. Remains of the process chemicals may however be found in the finished product and cause health or environmental problems.

Alkylphenol ethoxylates (APEO) and derivatives

The most common APEOs are Nonylphenol ethoxylates (NPEO) and Octylphenol ethoxylates (OPEO).

Required limit value:	Should not be used in processes. Occurrence in products below 100 mg/kg (0.01%) for total APEO is regarded as unintended residues (contaminants) which cannot be controlled.
CAS RN:	Various
Properties:	Irritating to skin. The metabolites affect the respiratory system, have endocrine disruptive effect (hormones) and are dangerous for the environment. Nonylphenol ethoxylates are rapidly degraded to 4-nonylphenol, which is even more dangerous for the environment. A similar environmental danger is the degradation of octylphenol ethoxylate into 4-octylphenol.
Use:	Dispersing and emulsifying agents in textile chemicals as well as impregnation agents in printing pastes. Occurs in leather lubricants. Manufacturing of coatings.
Comments:	Alternatives for NPEOs are readily available but must evaluated They include. They include aliphatic alcohol ethoxylates, both linear and branched, and glucose-based carbohydrate derivatives such as alkyl-polyglucosides, glucamides, and glucamine oxides.

Legal background:

Legal limit: NPEOs shall not be placed on the market in textile articles in concentrations equal to or greater than 0.01 weight% of that textile article or of each part of the textile article. Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 46a.
0.1 weight% of NPEO as a substance or in mixtures with exceptions for textile and leather processing if certain methods are used.

Norway restricts manufacture, import, export, sale and use of octylphenol and octylphenol ethoxylates, and mixtures containing these substances, FOR 2004-06-01-922.

4-Nonylphenol, branched and linear (4-NP, various CAS RN), 4-Nonylphenol, branched and linear, ethoxylated (4-NPnEO, various CAS RN), 4-(1,1,3,3-tetramethylbutyl)phenol (4-tert-OP, CAS RN 140-66-9), 4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated (4-tert-OPnEO, UVCB substance, no CAS RN), 4-tert-butylphenol (CAS RN 98-54-4) and tris(4-nonylphenyl, branched and linear) phosphite (TNPP) (no CAS RN) are on the Candidate List (REACH).

In France: The substances on the Candidate list as well as 4-tert-pentylphenol (CAS RN 80-46-6), 4-heptylphenol, branched and linear (e.g. CAS RN 1987-50-4), and Reaction products of 1,3,4-thiadiazolidine-2,5-dithione, formaldehyde and 4-heptylphenol, trendy and linear (RP-HP) [with ≥ 0.1 % w/w 4-heptylphenol, branched and linear] are included under the AGEC legislation (LOI n° 2020-105).

4-NPnEO and 4-tert-OPnEO are also included in Annex XIV to REACH.

Test method:

ISO 18254 -1, -2 (textile), APEO
EN ISO 21084 (textile), AP
ISO 18218-1, -2 (leather)

LOQ: 10 mg/kg

Arsenic compounds

Required limit value:	Should not be present in products.
CAS RN:	Various
Properties:	May cause cancer. Toxic by inhalation and toxic if swallowed. Persistent, bioaccumulative and toxic.
Use:	Fining agent in glass, pigment in metal alloy, preservative.
Comments:	Apply arsenic free compounds.
Legal limit:	Diarsenic Pentoxide; 1303-28-2 Diarsenic Trioxide; 1327-53-3 Triethyl arsenate; 15606-95-8 Arsenic acid; 7778-39-4 Calcium arsenate; 7778-44-1 are on the Candidate list (REACH). As wood preservatives regulated in Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 19 (limit level; no intentionally added content). Arsenic and its compounds have a restriction limit of 1 mg/kg (extractable content) in clothing, related accessories, textiles other than clothing in skin contact, or footwear according to Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 72. The restriction does not apply to clothing, related accessories, textiles other than clothing, or footwear within the scope of Regulation (EU) 2016/425 (PPE). In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105). In California: Inorganic arsenic compounds and inorganic arsenic oxides are listed in Proposition 65. Safe Harbor Limit for inorganic arsenic compounds: NSRL 0.06 µg/day (inhalation), 10 µg/day (except inhalation).
Test method:	EN 16711-1 (total content in textiles and accessories). EN 16711-2 (extractable content and accessories). ISO 19050 (rubber) LOQ: 0.1 mg/kg (extractable content)

Bisphenols

Required limit value:
Should not be present in products.

CAS RN:
Bisphenol A; BPA (4,4'-isopropylidenediphenol): 80-05-7
2,2-bis(4'-hydroxyphenyl)-4-methylpentane: 6807-17-6
Bisphenol B; (4,4'-(1-methylpropylidene)bisphenol): 77-40-7
Bisphenol S; (4,4'-sulphonyldiphenol): 80-09-1

Properties:
Toxic for reproduction. Endocrine disrupting properties.

Use:
Mainly used in manufacture of polycarbonate epoxy resins and chemicals. Also as; hardener in epoxy resins and in thermal prints. May be used as catalyst and antioxidant for processing PVC. Different bisphenols occur as impurities in leather processing. Bisphenol B and F may occur as impurities or break down products from the process of polyamide dyeing to increase colour fastness.

Comments:
Left as residues in polycarbonate and epoxy. Can be found in products with material based on plastic and paper.

Legal background:
BPA, Bisphenol B, Bisphenol S and 2,2-bis(4'-hydroxyphenyl)-4-methylpentane are listed on the Candidate list (REACH).

Bisphenol A (BPA) content in thermal paper (0.02% by weight), is restricted from January 2020 according to Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 66.

In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105).

In California: BPA and BPS are listed in Proposition 65. Safe Harbor Limit for BPA: MADL 3 µg/day (dermal exposure from solid materials).

Test method:
ISO 11936 (leather)
No standardised test method for textile available.

Test equipment LC-MS, GC-MS.
LOQ: 10 mg/kg

C,C'-azodi(formamide) (ADCA)

Required limit value:	Should not be used in processes or present in products.
CAS RN:	123-77-3
Properties:	Allergenic (respiratory sensitizer).
Use:	Azodicarbonamide, or azodiformamide is mainly used as a chemical blowing agent in the rubber and plastics industry. Blowing agent in especially EVA and PVC.
Comments:	Can leave residues of formamide in the material. ADCA may decompose into semicarbazide, a suspected carcinogen. Use physical blowing agents such as carbondioxide, hydrocarbons or nitrogen as alternative to chemical blowing agents when possible.
Legal background:	ADCA is listed on the Candidate list (REACH). In France: The substances on the Candidate list are included in the AGEC legislation (LOI n° 2020-105).
Test method:	No standardised test method available for textiles. Test equipment: GC-MS, LC-MS LOQ: 200 mg/kg

Dicumyl peroxide

Required limit value:	Should not be used in processes or present in products.
CAS RN:	80-43-3
Properties:	Toxic for reproduction.
Use:	Crosslinker in plastic and plastic foams (rubber, synthetic rubber, elastomers of PS, PE, PP, EVA), e.g. in shoes.
Comments:	Can leave residues of acetophenone, 2-phenyl-2-propanol and *alpha*-methyl-styrene in the material.
Legal background:	Dicumyl peroxide is on the Candidate List (REACH). In France: The substances on the Candidate list are included in the AGEC legislation (LOI n° 2020-105).
Test method:	No standardised test method available for textiles. Test equipment: GC-MS LOQ: 100 mg/kg

Ethylenediamine (EDA)

Required limit value:	Should not be present in products.
CAS RN:	107-15-3
Properties:	Allergenic (respiratory and skin sensitizer).
Use:	Used in the production of many industrial chemicals. Used in the production of polyurethane fibres.
Legal background:	Ethylenediamine is listed on the Candidate list (REACH). In France: The substances on the Candidate list are included in the AGEC legislation (LOI n° 2020-105).
Test method:	No standardised test method available. Test equipment: LC-MS, GC-MS LOQ: 100 mg/kg

Ethylenethiourea

Required limit value:	Should not be present in products.
CAS RN:	Imidazolidine-2-thione (2-imidazoline-2-thiol) also called ethylenethiourea: 96-45-7
Properties:	Toxic for reproduction.
Use:	Used primarily as an accelerator for vulcanizing rubber.
Legal background:	Ethylenethiourea is listed on the Candidate list (REACH). In France: The substances on the Candidate list are included in the AGEC legislation (LOI n° 2020-105). In California: Ethylenethiourea is listed in Proposition 65. Safe Harbor Limit: NSRL 20 µg/day.
Test method:	No standardised test method available. Test equipment: LC-MS LOQ: 20 mg/kg

Formamide

Required limit value:	Should not be present in products.
CAS RN:	75-12-7
Properties:	Toxic for reproduction.
Use:	Formamide is used as solvent for example in the production of synthetic leather and inks. Furthermore, formamide is used as a solvent and plasticizer in consumer products. It can be an ingredient as softener for paper, water soluble glues and wood stains. During processing of foam, formamide is formed as a by-product at higher temperatures. Especially tosylsemicarbazide and azodicarbonamide (see headline ADCA above) are responsible for the presence of formamide in EVA-consumer products.
Comments:	For the application as solvent, formamide might be replaced by other solvents like dipropylene glycol. Potential alternatives as N,N-dimethylformamide, N-methylformamide or low molecular weight ethylene glycol ethers are not considered to be adequate substitutes due their similar toxicity to reproduction.
Legal background:	Formamide is listed on the Candidate list (REACH). In France: The substances on the Candidate list are included in the AGEC legislation (LOI n° 2020-105). Formamide is restricted in puzzle mats in Belgium and France and is included in the Toy Safety Directive (limit value 200 mg/kg).
Test method:	No standardised test method available. Solvent extraction. Test equipment: GC-MS or LC-MS LOQ: 50 mg/kg

Hydrazine

Required limit value:	Should not be used in processes or present in products.
CAS RN:	Hydrazine: 302-01-2, 7803-57-8
Properties:	Carcinogenic, allergenic, toxic.
Use:	Mainly used as a chemical blowing agent in preparing polymer foams.
Comments:	Use physical blowing agents such as carbondioxide, hydrocarbons or nitrogen as alternative to chemical blowing agents when possible
Legal background:	Hydrazine is listed on the Candidate list (REACH). In France: The substances on the Candidate list are included in the AGEC legislation (LOI n° 2020-105). In California: Hydrazine is listed in Proposition 65. Safe Harbor Limit: NSRL 0.04 µg/day.
Test method:	No standardised test method available for textiles. Test equipment: UV-VIS Spectrometer. Detection limit: There is no standard international detection limit yet. Test equipment: GC-MS LOQ: 200 mg/kg

Hydroxymethyl acrylamide

Required limit value:	Should not be present in products.
CAS RN:	N-(hydroxymethyl)acrylamide: 924-42-5
Properties:	Mutagenic, Carcinogenic, Allergenic (skin sensitizer).
Use:	Used as a monomer in various applications in textiles and paper. In adhesives, as binders as well as in surface coatings and resins for varnishes, films and sizing agents. It is used in textile finishing for crease resistance, in antistatic agents and to increase the wet strength of paper.
Comments:	Residues of this monomer can be left in low concentrations in textile and paper products. Decomposition can cause the formation of formaldehyde.
Legal background:	Included in the Candidate list (REACH). In France: The substances on the Candidate list are included under the AGEC legislation (LOI n° 2020-105).
Test method:	No standardized test method available. Test equipment LC-MS, GC-MS. LOQ: 500 ppm

Melamine

Required limit value: Should not be present in products.

CAS RN: 108-78-1

Properties: Persistent and mobile in environment, Toxic, Carcinogenic

Use: Used to make melamine derivatives and melamine polymers. Melamine formaldehyde polymers as tanning agent for leather, hand building finish, crease resistant finish (cross-linker) especially for cellulosic fabrics, wet fastness finish. Melamine derivatives in water repellents. Also, in flame retardants for textile coatings (blowing agent) and foams (especially polyurethane foams).

Legal background: Included in the Candidate list (REACH).

In France: The substances on the Candidate List are included under the AGEC legislation (LOI n° 2020-105).

Test method: No standardized test method available.
Test equipment LC-MS, GC-MS.

PAH - Polycyclic aromatic hydrocarbons

Required limit value:	Should not be used in processes or present in products.
CAS RN:	Various, regulated PAHs are listed in Appendix 9.
Properties:	Carcinogenic, allergenic (sensitizer), toxic. Several are persistent, bioaccumulative and toxic in the environment.
Use:	PAHs are not synthesized chemically for industrial purposes. The major source of PAHs is the incomplete combustion of organic material such as coal, oil and wood. They are used as intermediaries in pharmaceuticals, agricultural products, photographic products, thermosetting plastics, lubricating materials, and other chemical industries. May be found as impurities in rubber materials, soft plastics, leather, and colored plastics containing carbon black.
Comments:	Avoid critical sources for PAH such as Carbon Black and contaminated mineral oil-based lubricants (extender oil) in rubber.

Legal background:

Regulated PAHs are listed in Appendix 9.

Eight PAHs are listed in annex XVII, entry 50 of the Regulation (EC) No 1907/2006 (REACH). Rubber and plastic materials in skin contact shall not include any of those eight PAHs in amounts higher than 1 mg/kg. For materials in toys or childcare articles the limit value is 0.5 mg/kg.

Eight PAHs are listed in annex XVII, entry 72 of the Regulation (EC) No 1907/2006 (REACH), with a restriction limit of 1 mg/kg in clothing, related accessories, textiles other than clothing in skin contact, or footwear.

Ten PAHs are included on the Candidate list (REACH).

In France: The substances on the Candidate list are included in the AGEC legislation (LOI n° 2020-105).

The restriction does not apply to clothing, related accessories, textiles other than clothing, or footwear within the scope of Regulation (EU) 2016/425 (PPE).

The voluntary German GS standard that most products in the German market follows, has requirements for 15 PAHs.

In California: Several PAH are listed in Proposition 65. Safe Harbor Limit: NSRL 0.033-0.35 µg/day.

Test method:

AfPS GS 2019-01 PAK
ISO/TS 16190 (footwear)
EN 17132 (textile)
LOQ: 0.2 mg/kg

Quinoline

Required limit value:	Should not be present in products.
CAS RN:	91-22-5
Properties:	Carcinogenic and mutagenic.
Use:	Quinoline is used mainly as an intermediate in the manufacture of other products. Quinoline is also used as a catalyst or vulcanisation accelerator in rubber, a corrosion inhibitor, in metallurgical processes, in the manufacture of dyes, in polymers, and as a solvent for resins and terpenes. Many disperse and vat dyes may contain quinoline as a contaminate in their dispersing agents.
Comments:	Isoquinoline (CAS RN 119-65-3) with similar structure (and concerns) as quinoline, and other quinoline derivates have similar area of use.
Legal background:	Quinoline has a restriction limit of 50 mg/kg in clothing, related accessories, textiles other than clothing in skin contact, or footwear according to Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 72. The restriction does not apply to clothing, related accessories, textiles other than clothing, or footwear within the scope of Regulation (EU) 2016/425 (PPE). In California: Quinoline is listed in Proposition 65.
Test method:	prEN ISO 13144 Test equipment: GC-MS, LC-MS. LOQ: 10 mg/kg

Solvents - Aliphatic organic solvents

Required limit value:	No odour.
CAS RN:	Various
Properties:	Liquids or gases. Inhalation can affect the nervous system and cause headache, fatigue and nausea , as well as chronic effects. Cause irritation on skin, eyes and mucous membranes.
Use:	Solvents for dyeing and printing. Solvents that have been used for cleaning of spinning oils from textiles are often found in amounts of 10-20 mg/kg. The limit for humans to sense a smell lies around 100 mg/kg for most substances.
Comments:	If possible, chose water-based systems based on easily degradable surfactants. If not possible to switch over to water based-water-based systems, there are statutory hygienic limit values for employees in many countries for strict compliance to maintain workers safety
Legal background:	2-methoxyethyl acetate, CAS RN 110-49-6 is on the Candidate list (REACH). Manufacturers in EU are required to follow the Industrial emissions directive, (EU) 2024/1785. In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105). The legislation also regulates certain mineral oil in ink for packaging and printed paper. Limit: 0.1% for mineral oil saturated hydrocarbons (MOSH) consisting of 16 to 35 carbon atoms by January 2025
Test method:	SNV 195 651, screening method. Panel odour test. Detection limit: No odour. No standardised quantitative test method available. Test equipment: GC-MS

Solvents - Aromatic organic solvents

Required limit value: Should not be present in products.

CAS RN: Various

Properties: Liquids or gases. Inhalation can affect the nervous system and cause headache, fatigue and nausea , as well as chronic effects. Cause irritation on skin, eyes and mucous membranes. Kerosene and diesel odour in finished products. Some aromatic organic compounds are carcinogenic.

Use: Solvents for dyeing and printing. Stain removal. Coatings and binders.

Comments: To avoid problems with organic solvents, switching to water-based dyeing and printing processes, is recommended. Many but not all aromatic organic solvents are volatile organic compounds (VOC). If not possible to switch over to water based systems, there are statutory hygienic limit values for employees in many countries for strict compliance to maintain workers safety.

Legal background: Benzene (CAS RN 71-43-2) has a restriction limit of 5 mg/kg in clothing, related accessories, textiles other than clothing in skin contact, or footwear according to Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 72. The restriction does not apply to clothing, related accessories, textiles other than clothing, or footwear within the scope of Regulation (EU) 2016/425 (PPE).

Manufacturers in the EU are required to follow the Industry Emissions Directive “IED”, (EU) 2024/1785.

In California: Benzene is listed in Proposition 65. Safe Harbor Limit: NSRL 6.4 µg/day (oral), 13 µg/day (inhalation). MADL: 24 µg/day (oral), 49 µg/day (inhalation).

France regulates certain mineral oils in ink for packaging and printed paper (the AGEC legislation LOI n° 2020-105). Limits: 1.0% for Aromatic hydrocarbons (MOAH) consisting of 1 to 7 aromatic rings by January 2023; 0.1% for MOAH consisting of 1 to 7 aromatic rings by January 2025 and 1 ppm MOAH compounds containing 3 to 7 aromatic rings by January 2025.

Test method: SNV 195 651, screening method. Panel odour test.
Detection limit: No odour.

No standardised quantitative test method available.
Test equipment: GC-MS
(EN 17137 (textile) can be used as reference for in-house methods though it only applies to chlorobenzenes and chlorotoluenes)
LOQ: 0.5 mg/kg

Solvents - Chlorinated organic solvents

Required limit value: Should not be used in processes or present in products.

CAS RN: Various

Properties: Liquid or gas. Affect the nervous system. Irritating to skin and mucous membranes. Many chlorinated organic solvents are dangerous for the environment.

Use: Solvents used in the manufacture of rubber, metal paint and fur industry used for grease and oil, e.g. in stain removers. Also used in cleaning agents and detergents. Solvents in lubricating oils. Solvents in dyeing of synthetic fibres (carriers) at atmospheric pressure. Certain chlorobenzenes can be used to make deodorisers or degreasers for leather and wool, where 1,2-dichlorobenzene is used.Solvents in printing. Finishing agents. Fabric softeners. Also used as moth-proofing agent in textiles and for the manufacture of silk and pearls.

See also under heading “Flame retardants”.

Comments: Where possible, apply water-based emulsions based on easily degradable surfactants. Alternative products are available or under development for all uses.

Carriers do not need to be used for dyeing in high-pressure machinery.

Categories of carriers also recommended not to be used: Chloronaphthalenes, which are toxic and cause liver damage, chlorobenzenes and chlorotoluenes, which are toxic and can cause liver and kidney damage and irritate eyes and airways.

Legal background: Manufacturers in EU are required to follow the Industry Emissions Directive (IED), (EU) 2024/1785.

In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105).

In California: Several chlorinated solvents are listed in Proposition 65. Safe Harbor Limit: NSRL 3-50 µg/day.

Solvent	CAS-RN	Legal framework	Legal requirement
Chloroform 1,1,2-trichloroethane 1,1,2,2-tetrachloroethane 1,1,1,2-tetrachloroethane Pentachloroethane 1,1-dichloroethylene 1,4-dichlorobenzene	67-66-3 79-00-5 79-34-5 630-20-6 76-01-7 75-35-4 106-46-7	Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 32-38.	Shall not be placed on the market, or used as substances, as constituents of other substances or in mixtures in concentrations equal to or greater than 0.1% by weight.
Carbon tetrachloride 1,1,1-trichloroethane	56-23-5 71-55-6	Regulation (EC) No 1005/2009 of the European Parliament and of the Council of 16 September 2009 on substances that deplete the ozone layer.	Shall not be produced, placed on the market, or used.
α,α,α,4-tetrachlorotoluene; p-chlorobenzotrichloride α,α,α-trichlorotoluene; benzotrichloride α-chlorotoluene; benzyl chloride	5216-25-1 98-07-7 100-44-7	Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 72.	1 mg/kg /in clothing, related accessories, t extiles other than clothing in skin contact, or footwear
Trichloroethylene	79-01-6	Listed in both annex XIV and in the Candidate List of Substances of Very High Concern for authorization and annex XIV in Regulation (EC) No 1907/2006 (REACH).	0.1% by weight in articles for information duty.
1,2,3-trichloropropane	96-18-4	Candidate List of Substances of Very High Concern for authorization in Regulation (EC) No 1907/2006 (REACH).	0.1% by weight in articles for information duty.

Test method:

No standardised test method for all substances available.

Test equipment: GC-MS, GC-ECD
EN 17137 (textile) for chlorotoluenes and chlorobenzenes.

LOQ: 0.5 mg/kg

Solvents - DMFa (N,N-dimethylformamide)

Required limit value:

Should not be present in products in concentrations above 500 mg/kg (sum of DFMa, DMAC and NMP).

CAS RN:

N,N-dimethylformamide (DMFa): 68-12-2

Properties:

Toxic to reproduction. It may have a faint amine odour in finished products.

Use:

Good solvency properties for polymers. Used as solvent in textile coating processes and in production of leather imitations, acrylic fibers, aramide fibers and elastomers such as PU. Can also be used for resins, metal coated plastics and as a paint stripper.

Comments:

Use “water-borne” PU, if possible, which contain less DMFa.

Legal background:

DMFa is included on the Candidate list (REACH).

DMFa have a restriction limit of 3000 mg/kg in clothing, related accessories, textiles other than clothing in skin contact, or footwear according to Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 72.

The restriction does not apply to clothing, related accessories, textiles other than clothing, or footwear within the scope of Regulation (EU) 2016/425 (PPE).

The standard for protective gloves (PPE) limits DMFa (1000 ppm) in gloves containing PU.

In France: The substances on the Candidate list are included in the AGEC legislation (LOI n° 2020-105).

Restricted in polyurethane-coated work gloves in Germany. The maximum DMFa content must be less than 10 mg/kg glove material (TRGS 401).

In California: DMFa is listed in Proposition 65.

Test method:

EN 16178 (footwear and footwear components)
EN 16778 (protective gloves)
CEN ISO 16189 (footwear and footwear components)

EN 17131 (textile)

Test equipment: GC-MS

LOQ: 10 mg/kg

Solvents - DMAC (N,N-dimethylacetamide)

Required limit value:

Should not be present in products in concentrations above 500 mg/kg (sum of DFMa, DMAC and NMP).

CAS RN:

N,N-dimethylacetamide (DMAC): 127-19-5

Properties:

Toxic to reproduction, irritating.

Use:

Good solvency properties for polymers. Used as solvent in textile coating processes and in production of leather imitations, acrylic fibers, aramide fibers and elastomers such as PU. Can also be used for resins, metal coated plastics and as a paint stripper.

Comments:

Use “water-borne” systems if possible.

Legal background:

DMAC is included on the Candidate list (REACH).

DMAC has a restriction limit of 3000 mg/kg in clothing, related accessories, textiles other than clothing in skin contact, or footwear according to Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 72. The restriction does not apply to clothing, related accessories, textiles other than clothing, or footwear within the scope of Regulation (EU) 2016/425 (PPE).

In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105).

In California: DMAC is listed in Proposition 65.

Test method:

prEN 17131-1 (textile)

Test equipment: GC-MS, LC-MS

LOQ: 10 mg/kg

Solvents - NMP (N-methyl-2-pyrrolidone)

Required limit value:

Should not be present in products in concentrations above 500 mg/kg (sum of DFMa, DMAC and NMP).

CAS RN:

N-methyl-2-pyrrolidone (NMP): 872-50-4

Properties:

Toxic to reproduction, irritating.

Use:

Good solvency properties for polymers. Used as solvent in textile coating processes and in production of leather imitations, acrylic fibers, aramide fibers and elastomers such as PU. Can also be used for resins, metal coated plastics and as a paint stripper.

Polyamide precursor. SBR (styrene-butadiene) latex production.

Comments:

Use “water-borne” systems if possible. Note that NEP (1-ethylpyrrolidin-2-one), CAS 2687-91-4 is not a suitable alternative to NMP since it is Reproduction Toxic 1B (a CMR substance) and ongoing regulation of a limit value for working environment.

Legal background:

NMP is included on the Candidate list (REACH).

NMP has a restriction limit of 3000 mg/kg in clothing, related accessories, textiles other than clothing in skin contact, or footwear according to Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 72. The CMR restriction does not apply to clothing, related accessories, textiles other than clothing, or footwear within the scope of Regulation (EU) 2016/425 (PPE). NMP has also a limit value for working environment under Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 71.

In France: The substances on the Candidate list are included in the AGEC legislation (LOI n° 2020-105).

In California: NMP is listed in Proposition 65. Safe Harbor Limit: MADL 3200 µg/day (inhalation), 17000 µg/day (dermal).

Test method:

EN ISO 19070 (leather)
prEN 17131-1 (textile)

Test equipment: GC-MS, LC-MS

LOQ: 25 mg/kg

Tin organic compounds (Organostannic compounds)

Required limit value:

Should not be present in products.

CAS RN:

Various

Properties:

Tributyltin, dibutyltin and dioctyltin compounds are different chemical substances that are toxic and dangerous for the environment. Bioaccumulative and persistent.

Use:

Dibutyltin compounds (DBT) and dioctyltin compounds (DOT) are used in consumer products as stabilizers (mainly PVC) or catalysts (PU and PVC). Organotin catalysts are used in a wide variety of polyurethane applications, aiding formation of the urethane bond and generally functioning as Lewis acid catalysts.

Comments:

Alternative stabilizers are barium/zinc, potassium/zinc, calcium, calcium/zinc organic or methyltin stabilisers.

Alternative catalysts can be organotitanate or zirconate compounds (e.g. titanium 2-ethylhexanoate) or amines such as bis- (dimethyl-aminoethyl) ether (BDMAEE) and triethylenediamine (TEDA) along with organometallic compounds such as potassium acetate.

Trialkyltin compounds are biocides, see also the section regarding Biocidal agent.

Legal background:

Legal Limit: 0.1% by weight
Dioctyltin (DOT), dibutyltin (DBT) compounds and tri-substituted organostannic compounds such as tributyltin (TBT) shall not be used in articles. Annex XVII of the Regulation (EC) No 1907/2006 (REACH), entry 20.

Tributyltin oxide (TBTO), 56-35-9, Dibutyltin dichloride (DBTC), 683-18-1, 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-distannatetradecanoate (DOTE), 15571-58-1 and reaction mass of DOTE and MOTE, Dibutylbis(pentane-2,4-dionato-O,O')tin, 22673-19-4 and Dioctyltin dilaurate and related substances, e.g. 3648-18-8 are on the Candidate list (REACH).

In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105).

Test method:

EN ISO 22744-1, -2 (textile)
CEN ISO/TS 16179 (footwear).

Test equipment: GC-MS.
LOQ: 0.2 mg/kg

PRODUCT-RELATED (PROPERTY-LENDING) CHEMICALS

Allergenic dyes

Required limit value:	Should not be present in products.
CAS RN:	Various, 21 dyes are listed in Appendix 1
Properties:	Highly allergenic (strong skin sensitizers). They may also have other hazardous properties.
Use:	Dyeing of textile and leather imitation goods.
Comments:	Use other feasible dyes that are not hazard classified as skin sensitizers (skin allergens).
Legal background:	Legal limit: 0.1% by weight for Navy Blue, EC# 405-665-4 in chemical preparations used for colouring textile and leather articles in Annex XVII (entry 43) of Regulation (EC) No 1907/2006 of the European Parliament and of the Council (REACH). Eight disperse dyestuffs are banned in Germany, see Appendix 1.
Test method:	EN ISO 16373-1, -2, -3 (extractable dyestuff). DIN 54231 for textiles. LOQ: 50 mg/kg

Banned arylamines related to azo dyes

Required limit value:	Azo dyes that are degradable to carcinogenic arylamines should not be present in products.
CAS RN:	Various, Substances are listed in Appendix 2
Properties:	Carcinogenic. Some are allergenic (sensitizer). Arylamines can form part of the molecular structure of a dye. Certain azo dyes can form the listed banned arylamines.
Use:	Constituent of dyes. Dyeing and printing.
Comments:	Dyes that can release one of the banned aromatic amines may not be used. See Appendix 2 for a description of banned arylamines.
Legal background:	Legal limit in textile and leather articles: 0.003% by weight (30 mg/kg) per each of the arylamine breakdown products in the dyed parts of the article, which may come into direct and prolonged contact with the human skin or oral cavity. Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 43. 4-chloro-o-toluidinium chloride, 2-Naphthylammoniumacetate, 4-methoxy-m-phenylene diammonium sulphate, 2,4-diaminoanisole sulphate and 2,4,5-trimethylaniline hydrochloride have a restriction limit of 30 mg/kg in clothing, related accessories, textiles other than clothing in skin contact, or footwear according to Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 72. Several arylamines are on the Candidate list (REACH). The restriction does not apply to clothing, related accessories, textiles other than clothing, or footwear within the scope of Regulation (EU) 2016/425 (PPE). Azo colorants that may release carcinogenic amines mentioned in REACH, entry 43 are limited in PPE clothing and protective gloves. In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105). In California: Several arylamines are listed in Proposition 65. Safe Harbor Limit: NSRL 0.001-110 µg/day.
Test method:	EN ISO 14362-1, -3 (textile) EN ISO 17234-1, -2 (leather) (These methods are specified in REACH Annex XVII, Appendix 10) LOQ: 20 mg/kg (per each of the arylamine breakdown products).

UV stabilisers

Required limit value:

Should not be present in products.

CAS RN:

2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320); 3846-71-7
2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327); 3864-99-1
2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328); 25973-55-1
2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350); 36437-37-3
2-(2H-benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)phenol (UV-329), 3147-75-9
Bumetrizole (UV-326) 3896-11-5
3-benzylidene camphor (3-BC); 15087-24-8
6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol (DBMC); 119-47-1

Properties:

Benzotriazoles are Persistent, Bioaccumulative and Toxic. Benzylidene camphor has endocrine (hormone) disrupting properties. DBMC is toxic to Reproduction.

Use:

Benzotriazoles are UV-stabilizer for plastics, polyurethanes and rubber and constituent in formulations used for coating of surfaces, e.g. cars or special industrial wood coatings. Also used in dishwasher detergents, dry cleaning equipment, and de-icing/anti-icing fluids. 3-benzylidene camphor is a UV-stabilizer for cosmetics, but possibly also for polymeric materials.
DBMC is an antioxidant and/or stabilizer used in plastic and rubber.

Legal background:

UV-328 is listed as POP in the Stockholm Convention on Persistent Organic Pollutants (POPs) with a lilmit value of 1 mg/kg (from February 2025).
UV-320, UV-326, UV-327, UV-328, UV-329, UV-350 , 3-BC and DBMC are on the Candidate list (REACH).

In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105).

Test method:

ISO 24040:2022 (benzotriazoles)

Test equipment: GC-MS, LC-MS, GC-ECD

LOQ: 50 mg/kg (benzotriazoles)
LOQ: 100 mg/kg (3-BC and DBMC)

Cadmium (Cd) and cadmium salts

Required limit value:	Should not be present in products.
CAS RN:	Cadmium (metal): 7440-43-9
Properties:	Heavy metal that occurs naturally in small quantities in nature. Toxic to aquatic organisms. Non-biodegradable. Dangerous for the environment. Can cause kidney damage.
Use in textile and leather:	Can occur in pigmented plastisol(rubber prints.
Use in accessories and packaging:	Surface treatment. Pigment in colouring agent. Also in plastics as stabilizers and pigment. Cadmium-based stabilizers to increase the endurance of the material. For recycled packaging cadmium may have had a different original use.
Comments:	Alternatives are available, such as calcium-zinc based stabilizers. Order cadmium-free processes and materials. Occurrence in materials below 0.5 mg/kg is generally regarded as contaminations which cannot be controlled.

Legal background:

Legal limit: 0.01% by weight (100 mg/kg) in articles produced from plastic material and in the paint of painted articles.
Shall not be used in brazing fillers or in jewellery. Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 23.

Cadmium, Cadmium oxide (1306-19-0), Cadmium sulphide (1306-23-6), Cadmium chloride (10108-64-2), Cadmium fluoride (7790-79-6), Cadmium sulphate (10124-36-4, 31119-53-6), Cadmium nitrate (10325-94-7), Cadmium carbonate (513-78-0) and Cadmium hydroxide (21041-95-2) are on the Candidate list (REACH).

The sum of concentration levels of lead, cadmium, mercury and hexavalent chromium present in packaging or packaging components shall not exceed 100 ppm by weight.

Directive (EC) No 94/62/EC of 20 December 1994 on packaging and packaging waste.

Cadmium and its compounds have a restriction limit of 1 mg/kg (extractable content) in clothing, related accessories, textiles other than clothing in skin contact, or footwear according to Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 72. The restriction does not apply to clothing, related accessories, textiles other than clothing, or footwear within the scope of Regulation (EU) 2016/425 (PPE).

In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105).

In California: Cadmium and cadmium compounds are listed in Proposition 65. Safe Harbor Limit: MADL cadmium 4.1 µg/day (oral)

Cadmium is restricted in Denmark. Danish legal limits: 75 mg/kg. (Bekendgørelse nr. 858 af 5. September 2009 om forbud mod import salg og fremstilling af cadmiumholdige varer).

Test method:

EN 16711-1 (total content in textiles and accessories).
EN 16711-2 (extractable content in and accessories).
(Coated fabrics and garment components (e.g. buttons, zips, etc.) can also be tested by the methods above.)

EN ISO 17072-1 (extractable content in leather).
EN ISO 17072-2 (total content in leather).

LOQ: 10 mg/kg (total content), (0.1 mg/kg (extractable content).

Test equipment: XRF screening for metal cadmium.
LOQ: 50 mg/kg

CMR, Carcinogenic, Mutagenic, Reproductive toxic dyestuffs

Required limit value:	Should not be present in products.
CAS RN:	Various, 15 substances are listed in Appendix 3
Properties:	Carcinogenic, mutagenic or reproductive toxic. Characteristics: Dyestuffs that are classified as carcinogens, mutagenic, reproductive toxic according to CLP not including class 2 (only cat. 1A and 1B are CMR).
Use:	Dyeing of textile and leather goods.
Comments:	Alternatives: Use other dyestuff than the substances in Appendix 3.
Legal background:	C.I. Solvent Blue 4, C.I. Basic Blue 26, C.I. Basic Violet 3, Michler's base (101-61-1), 4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol (561-41-1), C.I. Direct Black 38 (1937-37-7) and C.I. Direct Red 28 (573-58-0) are on the Candidate list (REACH). Restrictions for use of substances, harmonised classified as carcinogens, mutagenic, reproductive toxic according to CLP including class 2 (only 1A and 1B are CMR), as substances, as constituents of other substances or in mixtures. These are found in REACH annex XVII, entry 28-30. C.I. Disperse Blue 1, C.I. Basic Red 9 and C.I. Basic Violet 3 with ≥ 0,1 % of Michler's ketone have a restriction limit of 50 mg/kg in clothing, related accessories, textiles other than clothing in skin contact, or footwear according to Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 72. The restriction does not apply to clothing, related accessories, textiles other than clothing, or footwear within the scope of Regulation (EU) 2016/425 (PPE). In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105). In California: Several dyestuff are listed in Proposition 65. Safe Harbor Limit: NSRL 0.09-300 µg/day.
Test method:	EN ISO 16373 (extractable dyestuffs) LOQ: 50 mg/kg

Chromium VI

Required limit value:

Should not be present in products.

CAS RN:

Chromium VI (Cr+6, hexavalent chromium): 18540-29-9

Properties:

Dangerous for the environment. Carcinogenic. Allergenic (sensitizer). Toxic.

Use:

Metal plated metal parts. Chromic acid is used as wood preservative. Some dyes may contain chromium.

Oxidation agent. Fixing chemical. Used for finishing of direct dyes to improve their wash fastness. Potassium dichromate is used for oxidation of vat and sulphur dyes. Chromium salts are used for preparation and finishing of acid dyes on silk and wool.

Tanning leather with basic chromium III salts is the most widely used method where chromium VI may occur as an impurity. Etching of artificial leather and rubber.

Comments:

Chromium III is an alternative in surface treatment of metal but only for decorative metal plating and not hard metal plating. Other metals such as tin and zinc may be used for metal plating instead of chromium VI.

Chromium III is an alternative as fixing agent in mordant dyeing.

Use acid dyes with high colourfastness to avoid use of chromium salts for dyeing of polyamide, silk, wool and leather. Use hydrogen peroxide and other per-salts to avoid the use of chromium VI-based salts.

In leather tanning chromium III is used but can oxidize to chromium VI under uncontrolled conditions. Oxidation can be limited by keeping pH below 4.5. Vegetable tanning agents are alternatives for leather if these tanning agents are formaldehyde free. Tanning with titanium is an emerging technology.

Chromium VI substances on candidate list are listed in Appendix 5.

Legal background:

Legal limit: 0.0003% by weight (3 mg/kg) for leather in direct skin contact. Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 47.

Chromium VI compounds have a restriction limit of 1 mg/kg (extractable chromium VI content) in clothing, related accessories, textiles other than clothing in skin contact, or footwear according to Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 72.

The restriction does not apply to clothing, related accessories, textiles other than clothing, or footwear within the scope of Regulation (EU) 2016/425 (PPE).

Chromium VI is limited (3 ppm) in PPE standard for leather clothing and footwear.

Chromium VI compounds on the Candidate list (REACH) are listed in Appendix 5.

Several Chromium VI compounds are also included in REACH Annex XIV.

The sum of concentration levels of lead, cadmium, mercury and chromium VI present in packaging or packaging components shall not exceed 100 ppm by weight.

Directive (EC) No 94/62/EC of 20 December 1994 on packaging and packaging waste.

In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105).

In California: Chromium VI is listed in Proposition 65. Safe Harbor Limit: NSRL 0.001 µg/day (inhalation), MADL 8.2 µg/day (oral).

Test method:

ISO 17075 -1, -2 (leather).
EN ISO 10195 (pre-aged leather)
No standardised test method available for textiles.
Test equipment: UV-VIS Spectrometer.

LOQ: 0.5 mg/kg

Metal chromium (Cr) may be analysed by
EN 16711-1 (total content in textiles and accessories)
EN 16711-2 (extractable content in textile and accessories)
ISO 17072-1 (extractable content in leather)
ISO 17072-2 (total content in leather).
ISO 19050 (rubber)

LOQ: 10 mg/kg (total content), 0.1 mg/kg (extractable content). XRF screening for metal chromium.
LOQ: 50 mg/kg

Flame retardants/Biocides - Boric acid, borate compounds

Required limit value:

Should not be present in products.

CAS RN:

Boric acid; 10043-35-3 and 11113-50-1
Disodium tetraborate anhydrous; 1303-96-4, 12179-04-3 and 1330-43-4
Tetraboron disodium heptaoxid, hydrate; 12267-73-1
Sodium perborate; perboric acid, sodium salt, 234-390-0
Sodium peroxometaborate, 7632-04-04
Disodium octaborate, 12008-41-2
Orthoboric acid, sodium salt, e.g. 13840-56-7
Barium diboron tetraoxide, 13701-59-2

Properties:

Toxic to reproduction.

Use:

Wood veneers/pressed wooden panels and boards. Boric acid and other boron compounds may be used as flame retardant in cellulosic materials, mainly wood, and biocidal agent in boards. Borate compounds may be used as bleaching agents in chemical preparations.

Comments:

Alternative flame retardants are available but must be evaluated. Halogen-free alternatives include phosphorus- and nitrogen-based flame retardants. Non-chemical barrier technologies such as blends of natural and synthetic fibres used in furniture and mattresses and high performance synthetic materials used in fire-fighter uniforms and other protective clothing can be options.

Legal limit:

Boric acid, Disodium tetraborate anhydrous, Disodium octaborate, Tetraboron disodium heptaoxide, hydrate, Sodium perborate; Perboric acid, sodium salt, Sodium peroxometaborate and Orthoboric acid, sodium salt are on the Candidate list (REACH).

In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105).

Test method:

Test equipment: AAS, ICP-MS and ICP-OES.

LOQ: 25 mg/kg for individual compounds (10 mg/kg for total Boron content).

Flame retardants/Plasticizers - Chloroparaffins

Required limit value:	Should not be present in products.
CAS RN:	Short-chain chloroparaffins (C10-C13, SCCP): e.g. 85535-84-8 Medium-chain chloroparaffins (C14-C17, MCCP): e.g. 85535-85-9, 198840-65-2, 1372804-76-6. Long-chain chloroparaffins (C18-, LCCP): 85535-86-0
Properties:	Persistent, bioaccumulative and toxic. Carcinogenic. Allergenic (sensitizer).
Use in textile:	Plasticizers and flame retardant in plastic material. Plasticizers in coatings and synthetic leather.
Use in leather:	Fat liquoring agent in leather production.
Use in accessories and packaging:	Plasticizers and flame retardant in plastic material and rubber.
Comments:	Alternative flame retardants are available but must be evaluated. Halogen-free alternatives include phosphorus- and nitrogen-based flame retardants. Non-chemical barrier technologies such as blends of natural and synthetic fibres used in furniture and mattresses and high performance synthetic materials used in firefighter uniforms and other protective clothing can be options.
Legal background:	Legal limit: Shall not occur. Short-chain chloroparaffins are listed as POP in the Stockholm Convention on Persistent Organic Pollutants (POPs) and banned in EU by Regulation (EU) No 2019/1021. Residues below 0.15 % SCCP by weight in articles are allowed to be placed on the market and used, as this is the amount of SCCP that may be present as an impurity in an article produced with MCCP. Short-chain chloroparaffins (C10-C13) and Medium-chain chloroparaffins (C14-C17) are on the Candidate list (REACH). In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105). In California: Chloroparaffins are listed in Proposition 65. Safe Harbor Limit: NSRL 8 µg/day.
Test method:	EN ISO 22818 (textiles). ISO 18219-1,-2 (leather). LOQ: 100 mg/kg (textiles)

Flame retardants/Plasticizer - Bis(2-ethylhexyl) tetrabromophthalate (TBPH)

Required limit value:	Should not be present in products.
CAS RN:	26040-51-7
Properties:	Very persistent and very bioaccumulative
Use:	Flame retardant and plasticizer for plastics, mainly PVC. In carpet backings and fabric coatings. Used in adhesives and sealants.
Comments:	Alternative flame retardants are available but must be evaluated. Halogen-free alternatives include phosphorus- and nitrogen-based flame retardants. Non-chemical barrier technologies such as blends of natural and synthetic fibres used in furniture and mattresses and high performance synthetic materials used in fire-fighter uniforms and other protective clothing can be options.
Legal background:	Bis(2-ethylhexyl) tetrabromophthalate covering any of the individual isomers and/or combinations thereof is listed in the Candidate list (REACH).
Test method:	No standardised test method available. Test equipment: GC-MS, LC-MS, GC-ECD, XRF to detect bromine). LOQ: 100 mg/kg

Flame retardants - Hexabromocyclododecan (HBCDD)

Required limit value:

Should not be present in products.

CAS RN:

Hexabromocyclododecane (HBCD, HBCDD): 25637-99-4, 3194-55-6, 134237-50-6,134237-51-7 and 134237-52-8

Properties:

Persistent, bioaccumulative and toxic. Halogenated organic additives in polymers may leach out and have a negative impact on health and environment.

Halogen containing polymers may form highly corrosive substances and an undefined range of halogenated substances that may be PBT or CMR when incinerated.

Use:

Flame retardant treatment of products, (i.e upholstery and interior textiles), where fire protection is required by regulation or requested by customer. Also used in packaging flakes made of polystyrene (PS).

Comments:

Alternative flame retardants are available but must be evaluated. Halogen-free alternatives include phosphorus- and nitrogen-based flame retardants. Non-chemical barrier technologies such as blends of natural and synthetic fibres used in furniture and mattresses and high performance synthetic materials used in firefighter uniforms and other protective clothing can be options.

Legal background:

Legal limit: Shall not occur.

Hexabromocyclododecane is listed as POP in the Stockholm Convention on Persistent Organic Pollutants (POPs) and is banned in EU by Regulation (EU) No 2019/1021. Residues below 75 ppm by weight are allowed in articles, as this amount may be present as an impurity.

Hexabromocyclododecane (HBCDD) and all major isomers are listed on the Candidate list (REACH).

In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105).

Test method:

EN ISO 17881-1 (textiles).
Test equipment: GC-MS, LC-MS, GC-ECD

LOQ: 20 mg/kg

Flame retardants - Polybrominated biphenyls (PBB) and Polybrominated diphenyl ethers (PBDE)

Required limit value:

Should not be present in products.

CAS RN:

Polybrominated biphenyls: 59536-65-1 (mix)
Hexabromobiphenyl: 36355-01-8
Tetrabromodiphenyl ether (TetraBDE): 5436-43-1
Pentabromodiphenyl ether (PentaBDE): 32534-81-9, 60348-60-9
Hexabromodiphenyl ether (HexaBDE): 68631-49-2, 207122-15-4
Heptabromodiphenyl ether (HeptaBDE): 207122-16-5, 446255-22-7
Octabromodiphenyl ether (OctaBDE): 32536-52-0
Decabromodiphenyl ether (DecaBDE): 1163-19-5

Properties:

Persistant, bioaccumulative and toxic. Halogenated organic additives in polymers may leach out and have a negative impact on health and environment.

Halogen containing polymers may form highly corrosive substances and undefined range of halogenated substances that may be PBT or CMR when incinerated.

Use:

Flame-retardant treatment of products, (i.e. upholstery and interior textiles), where fire protection is required by regulation or requested by customer.

Comments:

Alternative flame retardants are available but must be evaluated. Halogen-free alternatives include phosphorus- and nitrogen-based flame retardants. Non-chemical barrier technologies such as blends of natural and synthetic fibres used in furniture and mattresses and high performance synthetic materials used in firefighter uniforms and other protective clothing can be options.

Legal background:

Legal limit: Shall not occur.

TetraBDE, PentaBDE, HexaBDE, HeptaBDE, DecaBDE and Hexabromobiphenyl are listed as POP in the Stockholm Convention on Persistent Organic Pollutants (POPs) and are banned in EU by the POPs regulation (EU) No 2019/1021. Residues of TetraBDE, PentaBDE, HexaBDE, HeptaBDE, DecaBDE in mixtures and articles are considered as impurities if the sum of them is below 500 ppm. In substances, residues below 10 mg/kg by weight of each brominated diphenylether is considered as impurities. Hexabromobiphenyl is banned in detectable content.

OctaBDE, and polybrominated biphenyls (PBBs), are restricted in entry 45 and entry 8 of Annex XVII to Regulation (EC) No 1907/2006 (REACH).
-The legal limit for PBBs in textile articles with skin contact is detection limit.
-The legal limit for OctaBDE in articles or in flame-retardant parts of articles is 0.1 % by weight.

DecaBDE is on the Candidate list (REACH).

PBBs are listed in the Rotterdam Convention.

In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105).

In California: Pentabromodiphenyl ether mixture DE-71 and polybrominated biphenyls and polychlorinated biphenyls are listed in Proposition 65. Safe Harbor Limits: NSRL PBB 0.02 µg/day, PCB 0.09 µg/day.

Test method:

EN ISO 17881-1 (textiles)
EN 16377 for PBB (plastics)

Test equipment: GC-MS, LC-MS, GC-ECD.
LOQ: 10 mg/kg

Flame retardants – TCEP

Required limit value:

Should not be present in products.

CAS RN:

Tris(2-chlorethyl)phosphate (TCEP): 115-96-8

Properties:

Toxic for reproduction and suspected of causing cancer. Toxic to aquatic life with long-lasting effects.
Halogen containing polymers may form highly corrosive substances and undefined range of halogenated substances that may be PBT or CMR when incinerated.

Use:

Flame-retardant treatment of products, (i.e. upholstery and interior textiles), where fire protection is required by regulation or requested by customer. Plasticizers. May be used in leather, PU and PVC.

Comments:

Alternative flame retardants are available but must be evaluated. Halogen-free alternatives include phosphorus- and nitrogen-based flame retardants. Non-chemical barrier technologies such as blends of natural and synthetic fibres used in furniture and mattresses and high performance synthetic materials used in firefighter uniforms and other protective clothing can be options.

Legal background:

Tris(2-chlorethyl) phosphate (TCEP) is on the Candidate list (REACH).

In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105).

In California: TCEP is listed in Proposition 65.

Test method:

EN ISO 17881-2 (textiles)

Test equipment (for non-textile materials):
GC-MS, LC-MS, GC-ECD

LOQ: 5 mg/kg

Flame retardants/Plasticizers - Trisubstituted phosphates

Required limit value:

Should not be present in products.

CAS RN:

Trixylyl phosphate: 25155-23-1
Isopropylated phenyl phosphate (3:1), 68937-41-7
Triphenyl phosphate (TPP) 115-86-6

Properties:

Toxic for reproduction.

Use:

Plasticizer and flame retardant of PVC and PU. Plasticizer of vinylite (a copolymer of vinyl chloride and vinyl acetate), cellulosic resins and natural and synthetic rubber.

Comments:

Alternative flame retardants are available but must be evaluated. Halogen-free alternatives include phosphorus- and nitrogen-based flame retardants. Non-chemical barrier technologies such as blends of natural and synthetic fibres used in furniture and mattresses and high performance synthetic materials used in firefighter uniforms and other protective clothing can be options.

Legal background:

Trixylyl phosphate: 25155-23-1 and Phenol, isopropylated, phosphate (3:1), 68937-41-7 and triphenyl phosphate 115-86-6 are on in the Candidate list (REACH).

In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105).

Test method:

EN ISO 17881-2 (textiles)

Test equipment (for non-textile materials): GC-MS, LC-MS, GC-ECD
LOQ: 5 mg/kg

Formaldehyde

Required limit value:

20 mg/kg for textiles and leather goods for children under the age of two.

75 mg/kg for all clothing and related accessories, as well as textiles and leather goods that come into direct contact with the human skin to an extent similar to clothing.

CAS RN:

50-00-0

Properties:

Carcinogenic, mutagenic, allergenic (skin sensitizer).

Use:

Shrinkage-resistant treatment. Wrinkle-resistant treatment. Dirt-repellent treatment. Dye fixing agent. Preservative.

Organic cross linkers are used in synthetic tanning of leather ("synthans") and may release formaldehyde.

Comments:

Occurs naturally in small quantities in the atmosphere and in nature. Use products without formaldehyde or with very low concentrations of formaldehyde.

Due to its volatility, formaldehyde is "contagious". If a garment containing formaldehyde is placed on top of a garment without formaldehyde, the latter garment will be "infected".

Fabric samples for testing must be packed in air dense plastic bags (polyethylene, PE, or polypropylene, PP).

Legal background:

Formaldehyde has a restriction limit of 75 mg/kg in clothing, related accessories, textiles other than clothing in skin contact, or footwear according to Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 72. The restriction does not apply to clothing, related accessories, textiles other than clothing, or footwear within the scope of Regulation (EU) 2016/425 (PPE).

Formaldehyde and formaldehyde-releasing substances are restricted in furniture and wood-based articled (max release 0,062 mg/m^3) as well as other articles (max release 0,080 mg/m^3), according to Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 77.

Several countries have national legislation on formaldehydes, see Appendix 7.

German law (Bedarfsgegenständeverordnung and Chemikalien-Verbotsverordnung); Products with formaldehyde content shall be labelled. Cleaning and finishing agents shall not contain formaldehyde above 0.2%.

In California: Formaldehyde (gas) is listed in Proposition 65. Safe Harbor Limit: NSRL 40 µg/day.

Test method:

EN ISO 14184-1 (textiles)
ISO 17226-1 (leather, HPLC analysis)
ISO 17226-2 (leather, colorimetric analysis)
ISO 17226-3 (leather, VOC analysis)
ISO 27587 (leather, process auxiliaries)

LOQ: 16 mg/kg

Lead (Pb) and lead salts

Required limit value:

Should not be present in textiles.

100 mg/kg for lead as a metal in plastic and metallic accessories.
1 mg/kg (extractable content) in clothing, related accessories, textiles other than clothing in skin contact, or footwear.

CAS RN:

Lead (metal): 7439-92-1

Properties:

Lead exposure can give rise to a number of negative health effects, including damage to liver, nervous system and foetuses. Lead is mainly accumulated in bone tissue. It has a very long half-life in the human body. Use of lead in plastics has not been deemed to cause any significant environmental or health effects in the short term, but in the long term such use increases lead concentrations in the environment.

Use:

Lead salts are additives in plastics as stabilizers to increase the service of life of the material. May be used as pigment in paint and in coloured plastic material. Metallic surface coating of buttons and accessories. For recycled packaging material lead may have had a different original use. Lead metal can also be used to increase ductility of other metals.

Comments:

Alternative stabilizers are barium/zinc, potassium/zinc, calcium or calcium/zinc organic stabilizers. Alternative catalysts can be organotitanate or zirconate compounds (e.g. titanium 2-ethylhexanoate) or amines such as bis- (dimethylaminoethyl) ether (BDMAEE) and triethylenediamine (TEDA) and potassium acetate.

Legal background:

Lead and lead salts are on the Candidate list (REACH). SVHC lead compounds are listed in Appendix 6.

The sum of concentration levels of lead, cadmium, mercury and hexavalent chromium present in packaging or packaging components shall not exceed 100 ppm by weight

Directive (EC) No 94/62/EC of 20 December 1994 on packaging and packaging waste.

Lead salts are restricted in paint products (no restriction on painted articles) within the EU, entry 16 (lead carbonates) and 17 (lead sulphates). Lead and its compounds are restricted in jewellery articles and hair accessories within EU with a legal limit: 500 mg/kg (0.05%), entry 63. Lead and its compounds are restricted in articles that may be placed in the mouth by children with the legal limit 500 mg/kg (0.05%)[4], entry 63. Annex XVII of Regulation (EC) No 1907/2006 (REACH).

Lead and its compounds have a restriction limit of 1 mg/kg (extractable content) in clothing, related accessories, textiles other than clothing in skin contact, or footwear according to Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 72. The restriction does not apply to clothing, related accessories, textiles other than clothing, or footwear within the scope of Regulation (EU) 2016/425 (PPE).

Lead is restricted in Denmark. Danish legal limits: 100 mg/kg. *(Bekendgørelse nr. 856 af 5. September 2009 om forbud mod import og salg af produkter, der indeholder bly).*

In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105).

In California: Lead and lead compounds are listed in Proposition 65. Safe Harbor Limit: NRSL lead acetate 23 µg/day (oral), lead 15 µg/day (oral), lead phosphate 58 µg/day (oral), lead subacetate 41 µg/day (oral), MADL lead 0.5 µg/day.

Test method:

EN 16711-1 (total content in textiles and accessories)
EN 16711-2 (extractable content in textile and accessories)
EN 16711-3 (lead release from all materials in textile articles)
ISO 17072-1 (extractable content in leather)
ISO 17072-2 (total content in leather)
ISO 19050 (rubber)

LOQ: 10 mg/kg (total content), 0.1 mg/kg (extractable content).

Test equipment: XRF screening for metal lead
LOQ: 50 mg/kg

[4] The limit does not apply if the rate of lead release is 0.05 µg/cm² per hour (equivalent to 0.05 µg/g/h) or lower. For coated articles, this release rate must not be exceeded for at least two years of use.

Mercury

Required limit value:
Should not be present in products.

CAS RN:
Mercury (metal): 7439-97-6
Phenylmercury neodecanoat: 26545-49-3
Phenylmercury octanoate: 13864-38-5
Phenylmercury 2-ethylhexanoate: 13302-00-6
Phenylmercury propionate: 103-27-5
Phenylmercury acetate: 62-38-4

Properties:
Heavy metal that occurs naturally in small quantities in nature. Toxic to aquatic organisms and non-biodegradable. Dangerous for the environment. Can cause kidney damage.

Use:
Phenylmercury compound are used as catalysts in the production of polyurethane coatings, adhesives, sealants and elastomers. For recycled packaging mercury may have had a different original use as e.g. pesticide in woods.

Legal background:
Mercury compounds are restricted in impregnation of heavy-duty industrial textiles and yarn intended for their manufacture in Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 18. Phenyl mercury compounds are also restricted in entry 62 with a restriction limit of 0.01% = 100 mg/kg.

Regulation (EU) 2017/852 of the European Parliament and of the Council of 17 May 2017 on mercury restricts the export, import, use, storage and manufacturing of mercury.

Products containing mercury may not be placed on the Swedish market. Norway prohibits the manufacture, import, export and sale of articles that contain mercury or mercury compounds (0.001% (10 ppm). Denmark prohibits the import, export and sale of articles and part of articles that contain mercury or mercury compounds (0.01% (100 ppm). Mercury is under restriction globally through the Minamata Convention.

The sum of concentration levels of lead, cadmium, mercury and hexavalent chromium present in packaging or packaging components shall not exceed 100 ppm by weight. Directive (EC) No 94/62/EC of 20 December 1994 on packaging and packaging waste. Mercury and its compounds are listed in the Rotterdam convention.

In California: Mercury is listed in Proposition 65.

Test method:
EN 16711-1 (total content in textiles and accessories))
EN 16711-2 (extractable content in textiles and accessories))
ISO 17072-1 (extractable content in leather)
ISO 17072-2 (total content in leather)
ISO 19050 (rubber)

LOQ: 10 mg/kg (total content), 0.02 mg/kg (extractable content).
Test equipment: XRF screening for metal mercury.
LOQ: 50 mg/kg

Nickel (Ni), in accessories

Required limit value:

0.5 µg per cm^2 and week for products intended to come into direct and prolonged contact with the skin.

0.2 µg per cm^2 and week for piercing items.

CAS RN:

Nickel (metal): 7440-02-0

Properties:

Nickel is one of the most common substances that cause contact dermatitis. Highly allergenic (strong skin sensitizer). Suspected carcinogenic.

Use:

Nickel is often used in stainless steel and other alloys used in clothing accessories such as zippers, buttons and rivets.

Comments:

Refrain from using nickel-treated metals or nickel-containing metal coatings.

Legal background:

Annex XVII of Regulation (EC) No 1907/2006 of the European Parliament and of the Council (REACH, entry 27).

0.5 µg per cm^2 and week for products intended to come into direct and prolonged contact with the skin.
0.2 µg per cm^2 and week for piercing items.

Nickel release is limited (0.5 µg/cm2 per week) in PPE standard for metallic material in skin contact.

In California: Metallic nickel is listed in Proposition 65.

Test method:

Test method I: EN 12472:2020 and EN 1811:2023 (for coated items) EN
1811:2023 (for non-coated item).
EN 16128:2015 (spectacle frames and sunglasses)
(CEN methods specified in REACH Annex XVII, entry 27)

LOQ: 0.02 µg/cm^2 /week

Test method II (not for testing legal compliance): Screening test for nickel emission. Swedish pharmacies sell a test kit.

Detection limit II: Qualitative indication only = no occurrence.
(This screening method can also give a reading for other metals than Ni.)

PFAS - Highly fluorinated carboxylic acids (PFOA and related substances)

Required limit value: Should not be present in products.

CAS RN: Example: 335-67-1

Properties: Highly fluorinated carboxylic acids (PFCAs) such as PFOA are persistent, bioaccumulative and toxic (PBT) substances. Due to their extreme stability these chemicals will not degrade but will accumulate due to their persistency in the environment. PFCAs are water soluble and can contaminate drinking water. As a result of their long-range transport potential and mobility they can be found even in remote regions (e.g. the Artic).
PFOA can cause cancer (testicular and kidney cancer), liver damage and changes in immune- and endocrine system (e.g. cholesterol levels). Exposure to PFOA effects the foetus development during pregnancy and has adverse effects on breastfed infants (e.g. low birth weight). Other long chain fluorinated carboxylic acids are also classified as PBT substances. They can be as present as pure substances in products or as precursor chemicals (e.g. polymers) that form PFOA and other PFCAs due to transformation processes

Use: PFOA-related substances (e.g. side-chain fluorinated polymers) are used in water oil repellent textile finishes as well as impregnation agents in leather. PFOA and other PFCAs are used as an emulsifier in the production of fluoropolymers such as polytetrafluoroethylene (PTFE) etc.

Comments: Alternatives are technologies based on short chain fluorotelomer chemistry (< C7) and may only be used in applications where oil and stain repellent properties are essential such as protective occupational textiles when no other feasible alternatives are available.

Where oil repellent properties are not essential and just water repellence is required, non-fluorinated chemistries (C0) such as waxes and paraffins but not silicones are recommended.

Legal background: Legal limit: Shall not occur.
PFOA, its salts and related compounds are listed in the Stockholm Convention on Persistent Organic Pollutants (POPs) and banned in EU by the POPs Regulation (EU) No 2019/1021. Residues below 0.025 mg/kg of each substance, and 1 mg/kg of a combination of PFOA-related substances in substances, mixtures, and articles are allowed to be placed on the market and used, as these are amounts that may be present as impurities.

Legal background:

PFHxA (undecafluorohexanoic acid), its salts and PFHxA-related substances are restricted in articles (25 ppb for the sum of PFHxA and its salts, or 1 000 ppb for the sum of PFHxA-related substances, measured in homogeneous material) annex XVII Regulation (EC) No 1907/2006 (REACH), entry 79.
C9-C14 linear and/or branched perfluorocarboxylic acids (C9-C14 PFCAs) are restricted in articles, (25 ppb for the sum of C9-C14 PFCAs and their salts and 260 ppb for the sum C9-C14 PFCAs-related substances) annex XVII Regulation (EC) No 1907/2006 (REACH), entry 68.

Perfluoroheptanoic acid and its salts as well as other PFCAs including their salts (sodium and ammonium) and precursors are on the Candidate list (REACH).
Examples of PFCAs are listed below:
- (C7) Ammonium perfluoroheptanoate, 6130-43-4
- (C7) Potassium perfluoroheptanoate, 21049-36-5
- (C7) Perfluoroheptanoic acid, 375-85-9
- (C7) Sodium perfluoroheptanoate, 20109-59-5
- (C8) Pentadecafluorooctanoic acid (PFOA) and its ammonium salt (APFO), 335-67-1,3825-26-1,
- (C9) Perfluorononan-1-oic-acid (PFNA) and its sodium and ammonium salts, 375-95-1, 21049-39-8, 4149-60-4,
- (C10) Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts, 335-76-2, 3108-42-7, 3830-45-3,
- (C11) Henicosafluoroundecanoic acid (PFUnA), 2058-94-8,
- (C12) Tricosafluorododecanoic acid (PFDoA), 307-55-1,
- (C13) Pentacosafluorotridecanoic acid (PFTrDA), 72629-94-8,
- (C14) Heptacosafluorotetradecanoic acid (PFTA), 376-06-7,

(3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl) silanetriol
is restricted in spray products (2 ppb) annex XVII Regulation (EC) No 1907/2006 (REACH), entry 73.

Declaration duty in Sweden to the Swedish Chemicals Agency for PFAS in chemical products that are deliberately added. Composition needs not to be specified but the information duty applies without any concentration limit.

In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105).

In California: PFOA and perfluorononanoic acid (PFNA) and its salts are listed in Proposition 65.

Test method:

En 14582 (total fluorine)
EN 17681-1, 2 (Textile and textile products. Note the preliminary 2024 version is significantly different from previous versions)
ISO 23702-1 (leather)
Test equipment: LC-MS

LOQ: 10 µg/kg

PFAS - Highly fluorinated sulfonic acids (PFOS and related substances)

Required limit value: Should not be present in products.

CAS RN: Example: 1763-23-1, 355-46-4, 29420-49-3, 220689-12-3

Properties: Highly fluorinated sulfonic acids (PFSAs) such as PFOS are persistent, bioaccumulative and toxic (PBT) substances. Due to their extreme stability these chemicals will not degrade but will accumulate due to their persistency in the environment. PFSAs are water soluble and can contaminate drinking water. As a result of their long-range transport potential and mobility they can be found even in remote regions (e.g. the Artic).
PFOS can cause cancer (testicular and kidney cancer), liver damage and changes in immune- and endocrine system (e.g. cholesterol levels). Exposure to PFOS effects the foetus development during pregnancy and has adverse effects on breastfed infants (e.g. low birth weight). Other long chain fluorinated carboxylic acids (see legal background) are also classified as PBT substances. Also PFBS (a short chain PFSAs) has been recently identified as a substance of concern. They can be as present as pure substances in products or as precursor chemicals (e.g. polymers) that form PFOS and other PFSAs due to transformation processes.

Use: PFOS-related substances (e.g. side-chain fluorinated polymers) are used in water oil repellent textile finishes as well as impregnation agents in leather. PFOS other PFSAs are used as an emulsifier in the production of fluoropolymers such as polytetrafluoroethylene (PTFE) etc.

Salts of PFBS are used as additives in plastics for anti-static properties, as flame retardants (in PC) and in manufacturing processes of plastics (e.g. for compounding).

Comments: Alternatives are technologies based on short chain fluorotelomer chemistry (< C7) and should be used in applications where oil and stain repellent properties are essential such as protective occupational textiles.

Where oil repellent properties are not essential and just water repellency is required, non-fluorinated chemistries (C0) such as waxes and paraffins but not silicones are requested.

Legal background:

Legal limit: Shall not occur
PFOS and its derivatives are listed in the Stockholm Convention on Persistent Organic Pollutants (POPs) and banned in EU by the POPs Regulation (EU) No 2019/1021. Residues below the following limits are allowed to be placed on the market and used, as these are the amounts that may be present as impurity:
textiles or other coated materials: 1 µg/m^2 of the coated material
substances and mixtures: ≤ 10 mg/kg (0.001 %)
semi-finished products or articles: ≤ 1000 mg/kg (0.1 %)

Perfluorohexane-1-sulphonic acid (PFHxS) and its salts and related substances are listed in the Stockholm Convention on Persistent Organic Pollutants (POPs) and banned in EU by the POPs Regulation (EU) No 2019/1021. Residues below 0.025 mg/kg by weight of each substance,
and 1 mg/kg of a combination of PFHxS-related substances in substances, mixtures, and articles are allowed to be placed on the market and used, as these are amounts that may be present as impurities.

Perfluorobutane sulphonic acid (PFBS) and its salts, perfluorohexane-1-sulphonic acid (PFHxS)and its salts (PFHxS) are listed on the Candidate List (REACH).

In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105).

Declaration duty in Sweden from 1 January 2019 to the Swedish Chemicals Agency for PFAS in chemical products that are deliberately added. Composition needs not to be specified but the information duty applies without any concentration limit.

In California: Perfluorooctane sulfonic acid (PFOS) and its salts and transformation and degradation precursors are listed in Proposition 65.

Test method:

EN 14582 (total fluorine)
EN 17681-1, 2 (Textile and textile products. Note the preliminary 2024 version is significantly different from previous versions).
ISO 23702-1 (leather and coated leather)
Test equipment: LC-MS
LOQ: 0.1 µg/m^2 (for coated textile and other coated articles).

PFAS - Highly fluorinated ethers

Required limit value:	Should not be present in products.
CAS RN:	13252-13-6
Properties:	Highly fluorinated ethers (PFPEs) such as HFPO-DA (2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)propionic acid) were developed as replacements for PFOA and PFOS. They are water-soluble and mobile surfactants that are under suspicion to be equally persistent as other PFASs. While the bioaccumulation potential of HFPO-DA is still uncertain, this substance has showed adverse effects on kidney, immune- and haematological system, as well as effects on foetus development in animal studies. Other PFPEs are likely to be equally stable and mobile.
Use:	PFPEs are used as emulsifiers in the production of fluoropolymers such as polytetrafluoroethylene (PTFE) etc.
Comments:	Non-fluorinated emulsifiers such as hydrocarbons should be preferred to produce fluoropolymers. Fluorinated emulsifiers may only be applied for essential uses.
Legal background:	HFPO-DA, its salts and its acyl halides (CAS 13252-13-6, 67118-55-2, 2062-98-8 and 62037-80-3) are on the Candidate list (REACH). Declaration duty in Sweden from 1 January 2019 to the Swedish Chemicals Agency for PFAS in chemical products that are deliberately added. Composition needs not to be specified but the information duty applies without any concentration limit In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105).
Test method:	EN 14582 (total fluorine) EN 17681-1, 2 (Textile and textile products. Note the preliminary 2024 version is significantly different from previous versions). Test equipment: LC-MS LOQ: -

Phthalate esters

Required limit value:	0.1% by weight (1000 mg/kg) for regulated phthalates (sum of) in the material of interest (e.g. a print).
CAS RN:	Regulated phthalates are found in Appendix 8.
Properties:	Many phthalates are classified as toxic for reproduction. DIDP is of concern in connection with hepatic toxicity. Many phthalates are suspected endocrine disrupters
Use:	Phthalates may be used as plasticizers in polymers. Additives in adhesives, paints, lacquers, varnishes and solvents.
Comments:	Alternative plasticizers include citrates, sebacates, adipates, and phosphates etc. The terephthalate, DEHT and the cyclohexane DINCH are example of commercially available alternatives with low human and environmental toxicity. There are also polymers that do not require plasticizers. However, each application needs to be individually assessed for each best specific technical performance.

Legal background:

Annex XVII of Regulation (EC) No 1907/2006 of the European Parliament and of the Council (REACH) addresses the following legal limits:

0.1% by weight of the plasticized material in all articles for the sum of DEHP, DBP, BBP and DIBP, entry 51.

0.1% by weight in toys and childcare articles which can be placed in the mouth for DINP, DIDP and DNOP, entry 52.

DIHP, DMEP, DIPP, DPP and DnHP have a restriction limit of 1000 mg/kg in clothing, related accessories, textiles other than clothing in skin contact, or footwear according to Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 72. This limit applies to each substance individually or in combination with other phthalates that are classifies as CMR substances. The restriction does not apply to clothing, related accessories, textiles other than clothing, or footwear within the scope of Regulation (EU) 2016/425 (PPE).

Phthalate ester substances listed in found in Annex XIV, the Candidate list (REACH) and/or the French AGEC legislation (LOI n° 2020-105) in Appendix 8.

All phthalates in toys and childcare articles for children aged 0-3 years are restricted (0.05%) in Denmark (BEK nr 855).

In California: BBP, DINP, DEHP, DBP, DnHP and DIDP are listed in Proposition 65. Safe Harbor Limits:
NSRL BBP 1200 µg/day (oral), NSRL DINP 146 µg/day.
NSRL DEHP 310 µg/day (oral), MADL DBP 8.7 µg/day, MADL DnHP 2200 µg/day (oral), MADL DIDP 2200 µg/day.

Test method:

EN-ISO 14389 (textile)
ISO 16181 -1, -2 (footwear)

Test equipment: GC-MS, LC-MS
LOQ: 50 mg/kg

Siloxanes

Required limit value:

1000 mg/kg (0.1% by weight).

CAS RN:

107-51-7 Octamethyltrisiloxane (L3)
556-67-2 Octamethylcyclotetrasiloxane (D4)
541-02-6 Decamethylcyclopentasiloxane (D5)
540-97-6 Dodecamethylcyclohexasiloxane (D6)

Properties:

Reproduction toxic. Toxic to aquatic life with long lasting effects.

Use:

Used in the leather tanning industry in waterproofing fatliquors. Used in washing and cleaning products such as softeners, polishes and waxes, cosmetics and personal care products, textile treatment products and dyes, paper and cardboard products. Precursors in the production of polymers such as silicone rubbers.

Comments:

Alternatives to siloxane-based softeners are available but must be evaluated.

Legal background:

D4, D5 and D6 are on the Candidate list (REACH).

In France: The substances on the Candidate List are included in the AGEC legislation (LOI n° 2020-105).

D4, D5 and D6 shall not be used as a solvent for the dry cleaning of textiles, leather and fur (REACH, entry 70). The restriction applies after 6 June 2026 for D4 and D6, and after 6 June 2034 for D5.

Test method:

No standardised test methods.

Test equipment: GC-MS.
LOQ: 100 mg/kg

BIOCIDAL AGENTS

General information

Biocidal agents are widely used in textile and leather production, both as *process chemicals* to prohibit growth of bacteria or mold in materials and liquids during production, and as *product-related chemicals* (e.g. anti-odor and anti-moth treatment).
Articles at the EU market can have a biocidal treatment ONLY IF that biocide is approved for the specific use (as regulated in the Biocidal product regulation, BPR (EU 528/2012)). Some biocides are additionally regulated in the REACH regulation or in the POPs regulation.

Biocidal agents

Required limit value:	Should not be present in products.
CAS RN:	Examples of biocidal agents that are not approved in all or some of the applications in the scope of this guidance are listed in Appendix 4.
Properties:	Many biocidal agents have hazardous properties to human or the environment.
Use:	Bactericides and fungicides during production and storage to protect processing fluids or materials from deterioration. Fungicides to protect textile and leather articles from deterioration, i.e. outdoor applications and during transport. Insecticides to protect wool and other kreatinous fibres from deterioration. Bactericides as anti-odor treatment. Insect repellents and attractants, and insecticides added to article (e.g. textile) to protect human or pet. Virucides, bactericides, fungicides etcetera added to article (e.g. textile) to protect human from disease.
Comments:	The use of biocidal agents in articles should be limited, unless the use is essential to the product or process function.

Legal background:

Only approved biocides are allowed in the EU and in treated articles on the EU market (the Biocidal product regulation, BPR EU 528/2012). The approval status for the same chemical substance often varies for the products within our scope. Read about approved biocides at the Chemicals group webpage.

PCP and its salts and esters are listed in the Stockholm Convention on Persistent Organic Pollutants (POPs) and banned in EU by the POPs Regulation (EU) No 2019/1021. Residues below 5 mg/kg in substances, mixtures, and articles are allowed to be placed on the market and used, as this is the amount that may be present as an impurity in an article.

DMFu is restricted in Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 61 to 0.00001 % by weight (0.1 mg/kg) in articles or any parts of articles.

All trisubstituted tin organic compounds such as tributyltin (TBT) are restricted to 0.1 % by weight in articles in annex XVII of the Regulation (EC) No 1907/2006 (REACH), entry 20.

Glutaral and Tributyltin oxide (TBTO) are listed on the Candidate List (REACH).

In France: The substances on the REACH Candidate List are included in the AGEC legislation (LOI n° 2020-105).

Seven TBT compounds and Pentachlorophenol are listed in the Rotterdam convention.
In California: PCP is listed in Proposition 65. Safe Harbor Limit: NRSL 40 µg/day.

Test method:

Various for different biocides, including:

ISO/TS 16186 (DMFu in footwear)
SS-EN 17130 (DMFu in textile and textile material)
EN 17134-2 (PCP in textile at LOQ 0.1 mg/kg)
ISO 17070 (PCP in leather at LOQ 0.1 mg/kg)
XP G 08-015 (French standard method for PCP in textiles at LOQ 0.1 mg/kg).
CEN/TR 14823 (PCP in wood) at detection limit 25 mg/kg
EN ISO 15320 (PCP in pulp, paper and board)
EN ISO 22517 (Permethrin in leather)
EN ISO 22744-1, -2 (Trisubstituted tin organic compounds in textiles)
ISO/TS 16179 (Trisubstituted tin organic compounds)

MISCELLANEOUS

pH

Limit value textiles:	4.0 – 7.5 Protective clothing material (PPE) standard limits the pH value to greater than pH=3,5 and less than pH=9.5
Limit value leather:	3.5 – 7.0 Protective clothing material (PPE) standard limits the pH value to greater than pH=3,5 and less than pH=9.5
Properties:	A pH higher than 10 or lower than 3 can cause skin irritation.
Comments textiles:	The pH value can easily be corrected by washing.
Legal background:	None
Test method textiles:	ISO 3071
Test equipment:	pH meter. Accuracy: 0.2 pH units.
Test method leather:	EN ISO 4045
Test equipment:	pH meter. Accuracy: 0.2 pH units.

Synthetic polymer microparticles

Limit value:	Shall not be placed on market.
Comments textiles:	Microfiber release from the synthetic textile material itself is out of scope (unintentional release). Glitter bonded in garments and shoes, or sequins and beads that are sewn onto an article is also out of scope. Decorative items such as party/toy hats, Christmas decorations, craft items are covered by the restriction.
Legal background:	Annex XVII of Regulation (EC) No 1907/2006 (REACH), entry 78
Test method:	No standardised test method available.

Proposition 65 in California: Other chemicals listed

There are chemicals listed in Proposition 65 that are relevant to the materials addressed in this Chemicals guidance, but that are not otherwise included in this document. Those substances are listed in the table below. Please, note that Proposition 65 is a Californian legislation that does not apply in Europe.

Chemicals related to dyes

Substance name	CAS RN	Comment
Aniline	62-53-3	NSRL: 100 µg/day
Benzyl violet 4B	1694-09-3	NSRL: 30 µg/day
2-Bromopropane	75-26-3	No Safe Harbor Limit
Carbon black (airborne, unbound particles of respirable size)	1333-86-4	No Safe Harbor Limit
C.I. Acid Red 114	6459-94-5	No Safe Harbor Limit
C.I. Direct Blue 15	2429-74-5	No Safe Harbor Limit
Cobalt sulfate	10124-43-3	No Safe Harbor Limit
Ethylene dichloride (1,2-Dichloroethane)	107-06-2	NSRL: 10 µg/day
Ethylene oxide	75-21-8	NSRL: 2 µg/day MADL: 20 µg/day
Leucomalachite green	129-73-7	No Safe Harbor Limit
Michler's ketone	90-94-8	NSRL: 0.8 µg/day
Naphthalene	91-20-3	NSRL: 5.8 µg/day
1,3-Propane sultone	1120-71-4	NSRL: 0.3 µg/day
Trypan blue (commercial grade)	72-57-1	No Safe Harbor Limit
Hexachlorobenzene	118-74-1	NSRL: 0.4 µg/day

Chemicals related to materials

Substance name	CAS RN	Comment
Antimony oxide (Antimony trioxide)	1309-64-4	Polyester catalyst No Safe Harbor Limit
1-Butyl glycidyl ether	2426-08-6	Paints, coatings and adhesives No Safe Harbor Limit
Dichloromethane (Methylene chloride)	75-09-2	Triacetate (NSRL): 50 µg/day NSRL-Inhalation: 200 µg/day
Glycidyl methacrylate	106-91-2	Epoxy resins and adhesives No Safe Harbor Limit
N-Nitrosodimethylamine	62-75-9	Rubber NSRL: 0.04 µg/day
1,1,1-Trichloroethane	71-55-6	Solvent for various materials No Safe Harbor Limit

Biocides (Proposition 65 in California)

Substance name	CAS RN	Comment
Metham sodium	137-42-8	No Safe Harbor Limit
o-Phenylphenate, sodium	132-27-4	NSRL: 200 µg/day
o-Phenylphenol	90-43-7	No Safe Harbor Limit
2,4,6-Trichlorophenol	88-06-2	NSRL: 10 µg/day
Methyl bromide, as a structural fumigant	74-83-9	MADL - Inhalation: 810 µg/day

Flame retardants (Proposition 65 in California)

Substance name	CAS RN	Comment
Dimethyl hydrogen phosphite	868-85-9	No Safe Harbor Limit
Tris(1,3-dichloro-2-propyl) phosphate (TDCPP)	13674-87-8	NSRL: 5.4 µg/day
Vinyl bromide	593-60-2	No Safe Harbor Limit

Obsolete substances: Historically relevant substances, no longer in use.

Flame retardants

Substance name	CAS RN	Comment
Tris(1-aziridinyl)-phosphine oxide (TEPA)	545-55-1	Legal limit: Shall not be used Test method: GC-MS
Tris(2,3-dibromopropyl)phosphate (TBPP)	126-72-7	Legal limit: Shall not be used Test method: EN ISO 17881-2 (textile); GC-MS, LC-MS, GC-ECD, LOQ: 5 mg/kg (non-textile)

APPENDICES

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Appendix 1 - Allergenic dyestuffs and Navy Blue (banned mordant dye)

CI Name	CAS RN
C.I. Disperse Yellow 1	119-15-3
C.I. Disperse Blue 35	12222-75-2*
C.I. Disperse Blue 102	12222-97-8
C.I. Disperse Blue 106	12223-01-7*, 68516-81-4
C.I. Disperse Yellow 39	12236-29-2
C.I. Disperse Orange 37/59/76	13301-61-6*, 12223-33-5, 51811-42-8
C.I. Disperse Brown 1	23355-64-8
C.I. Disperse Blue 3	2475-46-9
C.I. Disperse Orange 1	2581-69-3
C.I. Disperse Yellow 3	2832-40-8*
C.I. Disperse Red 11	2872-48-2
C.I. Disperse Red 1	2872-52-8*
C.I. Disperse Red 17	3179-89-3
C.I. Disperse Blue 7	3179-90-6
C.I. Disperse Blue 26	3860-63-7
C.I. Disperse Yellow 49	54824-37-2, 6858-49-7
C.I. Disperse Blue 124	61951-51-7*
C.I. Disperse Yellow 9	6373-73-5
C.I. Disperse Orange 3	730-40-5*
Navy Blue	405-665-4 (EC #)
C.I Disperse Blue 1	2475-45-8*

**Disperse dyes banned in Germany*

Appendix 2 - Banned arylamines

Arylamines listed in Annex XVII, the Candidate List of Substances of Very High Concern for authorization of Regulation (EC) No 1907/2006 (REACH) and/or the French AGEC legislation (LOI n° 2020-105).

Name	CAS RN	Candidate list and AGEC	Annex XVII, Entry 43	Annex XVII, Entry 72
4,4-Methylene-bis[2-chloro-aniline]	101-14-4	x	x	
4,4-Methylenedianiline	101-77-9	x	x	
4,4'-oxydianiline	101-80-4	x	x	
4-chloroaniline	106-47-8		x	
o-Dianisidine	119-90-4		x	
4,4'-bi-o-toluidine	119-93-7		x	
p-Cresidine	120-71-8	x	x	
2,4,5-trimethylaniline	137-17-7		x	
4,4'-thiodianiline	139-65-1		x	
4-Aminoazobenzene	60-09-3	x	x	
4-methoxy-m-phenylenediamine	615-05-4		x	
4,4-Methylenedi-o-toluidine	838-88-0	x	x	
o-Anisidine	90-04-0	x	x	
2-Naphthylamine	91-59-8		x	
3,3-Dichlorobenzidine	91-94-1		x	
Biphenyl-4-ylamine	92-67-1	x	x	
Benzidine	92-87-5		x	
o-Toluidine	95-53-4	x	x	
4-Chloro-o-toluidine	95-69-2		x	
4-methyl-m-phenylenediamine	95-80-7	x	x	
o-Aminoazotoluene	97-56-3	x	x	
5-Nitro-o-toluidine	99-55-8		x	
4-chloro-o-toluidinium chloride	3165-93-3			x
2-Naphthylammoniumacetate	553-00-4			x
4-methoxy-m-phenylene diammonium sulphate; 2,4-diaminoanisole sulphate	39156-41-7			x
2,4,5-trimethylaniline hydrochloride	21436-97-5			x

Appendix 3 - Carcinogenic dyes

CI Name	CAS RN
C.I. Direct Brown 95	16071-86-6
C.I. Direct Black 38	1937-37-7*
C.I. Disperse Blue 1	2475-45-8**
C.I. Direct Blue 6	2602-46-2
C.I. Acid Red 26	3761-53-3
C.I. Basic Red 9	569-61-9**
C.I. Direct Red 28	573-58-0*
C.I. Basic Violet 14	632-99-5
C.I. Disperse Orange 11	82-28-0
C.I. Disperse Orange 149	85136-74-9
C.I. Solvent Blue 4	6786-83-0*
C.I. Basic Blue 26,	2580-56-5*
C.I. Basic Violet 3	548-62-9*, **
Michler's base	101-61-1*
4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol	561-41-1*
C.I. Disperse Yellow 3	2832-40-8

** SVHC substances, Note that substances on the Candidate list (SVHC) are also included in the French AGEC legislation (LOI n° 2020-105)*

*** Restricted in REACH annex XVII, entry 72*

Appendix 4 - Examples of non-approved Biocidal agents

Only approved biocides are allowed in the EU and in treated articles on the EU market. Some biocides are additionally restricted in the EU by REACH Annex XVII or the POPs regulation. This table includes examples of biocides that are not approved or that are only approved for some applications in the scope of this guidance.

Name	Target organisms	CAS RN	Candidate list and AGEC*	REACH, Annex XVII	POPs regulation
Carbendazim	Fungi/Mold	10605-21-7			
Chlorophenols, including: - PCP and its salts and esters	Fungi/Mold	e.g. 87-86-5, 131-52-2			x
- TeCP		935-95-5, 4901-51-3, 58-90-2			
Cu-HDO (Bis-(N-cyclohexyl diazeniumdioxy)-copper)	Fungi/Mold	312600-89-8			
DMFu – Dimethylfumarate	Fungi/Mold	624-49-7		x	
Formaldehyde	Several	50-00-0	x	x	
Glutaral	Several	111-30-8	x		
o-phenylphenol (OPP) and Sodium 2-biphenylate (Na-OPP)	Fungi/Mold	90-43-7, 132-27-4			
Permethrin, d-allethrin, esobiothrin, metofluthrin and empenthrin. Some other phyrethroids are approved.	Insects	Several			
Polyhexamethylene biguanide (PHMB)	Bacteria	e.g. 27083-27-8, 32289-58-0, 1802181-67-4			
Silver, silver-salts and nano-silver compounds.	Bacteria	Several			
Triclosan and Triclocarban	Bacteria	3380-34-5, 101-20-2			
Triflumuron	Insects	64628-44-0			
Trisubstituted tin organic compounds, including:	Bacteria	e.g. 1461-22-9, 1983-10-4, 2155-70-6, 4342-36-3, 24124-25-2, 85409-17-2		x	
- Tributyltin oxide (TBTO)		56-35-9	x	x	
Zinkpyrithion	Several	13463-41-7			

** Note that substances on the Candidate list (SVHC) are also included in the French AGEC legislation (LOI n° 2020-105)*

Appendix 5 - Chromium (VI) SVHC compounds

Chromium (VI) substances listed listed in Annex XVII, the Candidate List of Substances of Very High Concern for authorization of Regulation (EC) No 1907/2006 (REACH) and/or the French AGEC legislation (LOI n° 2020-105).

Name	CAS RN
Ammonium dichromate	7789-09-5
Potassium chromate	7789-00-6
Potassium dichromate	7778-50-9
Sodium chromate	7775-11-3
Sodium dichromate dehydrate	7789-12-0, 10588-01-9
Strontium chromate	7789-06-2
Chromium trioxide	1333-82-0
Chromic acid	7738-94-5
Dichromic acid	13530-68-2
Lead chromate	7758-97-6
Lead sulfochromate	1344-37-2
Lead chromate molybdate sulphate	12656-85-8
Dichromium tris(chromate)	24613-89-6
Potassium hydroxyoctaoxodizincatedichromate	11103-86-9
Pentazinc chromate octahydroxide	49663-84-5

Appendix 6 - SVHC lead metal and its compounds*

Name	CAS RN
Lead (metal)	7439-92-1
Lead chromate	7758-97-6
Lead sulfochromate	1344-37-2
Lead chromate molybdate sulphate	12656-85-8
Lead dipicrate	6477-64-1
Lead styphnate	15245-44-0
Lead diazide	13424-46-9
Lead hydrogen arsenate	7784-40-9
Lead monoxide (Lead oxide)	1317-36-8
Orange lead (Lead tetroxide)	1314-41-6
Lead bis(tetrafluoroborate)	13814-96-5
Trilead bis(carbonate)dihydroxide	1319-46-6
Lead titanium trioxide	12060-00-3
Lead titanium zirconium oxide	12626-81-2
Lead(II) bis(methanesulfonate)	17570-76-2
Silicic acid, lead salt	11120-22-2
Silicic acid (H2Si2O5), barium salt (1:1), lead-doped	68784-75-8
Acetic acid, lead salt, basic	51404-69-4
Lead oxide sulfate	12036-76-9
[Phthalato(2-)]dioxotrilead	69011-06-9
Dioxobis(stearato)trilead	12578-12-0
Fatty acids, C16-18, lead salts	91031-62-8
Lead cynamidate	20837-86-9
Lead dinitrate	10099-74-8
Pentalead tetraoxide sulphate	12065-90-6
Pyrochlore, antimony lead yellow	8012-00-8
Sulfurous acid, lead salt, dibasic	62229-08-7
Tetraethyllead	78-00-2
Tetralead trioxide sulphate	12202-17-4
Trilead dioxide phosphonate	12141-20-7
Lead di(acetate)	301-04-2

** Note that substances on the Candidate list (SVHC) are also included in the French AGEC legislation (LOI n° 2020-105)*

Appendix 7 - Regulations and limit values of formaldehyde

Country	Regulations/Requirements	Objection Limit / Limit
France	Official Gazette of the French Republic, Notification 97/0141/F	Textiles not in direct skin contact: 400ppm
Finland	Decree on Maximum Amounts of Formaldehyde in Certain Textiles products (Decree 210/1988)	Textiles not in direct skin contact: 300ppm
China	Limits of Formaldehyde Contents in Textiles GB18401-2003	Textiles for infants and babies ≤ 20ppm Textiles in direct skin contact ≤ 75ppm Textiles not in direct skin contact ≤ 300ppm
Japan	Japanese Law 112	Textiles for infants: not detectable Textiles in direct skin contact: 75ppm
Vietnam	Circular no 23/2016/TT-BCT	Textiles for babies under 36 months: 30 mg/kg. Textiles in direct skin contact: 75 mg/kg. Textiles not in direct skin contact: 300 mg/kg
USA	Federal Hazardous Substances Act (FHSA)	Consumer products containing more than 1% formaldehyde must be labelled with a warning.
Eurasian Customs Union (Armenia, Belarus, Kazakhstan Kyrgyzstan and Russia)	P TC 007/2011 On “Safety of Products intended for children and adolescents” TP TC 017/2011 On Safety of Light Industry Products GOST 50729-95 (Textiles. Limit permissible concentration of free formaldehyde)	Mass fraction of free Formaldehyde babies up to36 months: 20 mg/kg for 1st and 2nd layer of products and 300 mg/kg for 3rd layer Mass fraction of free Formaldehyde for children and adolescents: 75 mg/kg for 1st and 2nd layer of products and 300 mg/kg for 3rd layer Apply less than 20 mg free formaldehyde/kg as a customs requirement.

Appendix 8 - Phthalate esters

Substances listed in Annex XIV, Annex XVII, the Candidate List of Substances of Very High Concern for authorization of Regulation (EC) No 1907/2006 (REACH) and/or the French AGEC legislation (LOI n° 2020-105).

Name	CAS RN	Candidate list	Annex XIV	Annex XVII	AGEC
Bis (2-ethylhexyl) phthalate) (DEHP)	117-81-7	x	x	x (entry 51)	x
Dibutyl phthalate (DBP)	84-74-2	x	x	x (entry 51)	x
Benzyl butyl phthalate (BBP)	85-68-7	x	x	x (entry 51)	x
Diisobutyl phthalate (DIBP)	84-69-5	x	x	x (entry 51)	x
Di-isononyl phthalate (DINP)	28553-12-0 68515-48-0			x (entry 52)	
Di-isodecyl phthalate (DIDP)	26761-40-0 68515-49-1			x (entry 52)	
Di-n-octyl phthalate (DNOP)	117-84-0			x (entry 52)	
1,2-benzenedicarboxylic acid, di-C6-8-branched alkylesters, C7- rich	71888-89-6	x	x	x (entry 72)	x
Di-n-pentyl phthalate (DPP)	131-18-0	x	x	x (entry 72)	x
Di-n-hexyl phthalate (DnHP)	84-75-3	x	x	x (entry 72)	x
Diisopentyl phthalate	605-50-5	x	x	x (entry 72)	x
Bis (2-methoxyethyl) phthalate	117-82-8	x	x	x (entry 72)	x
1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	84777-06-0	x	x		x
n-pentyl-isopentyl phthalate	776297-69-9	x	x		x
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters	68515-42-4	x	x		x
1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	68515-50-4	x	x		x
1,2-Benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters, with ≥ 0.3% of dihexyl phthalate	68648-93-1	x	x		x
1,2-Benzenedicarboxylic acid, di-C6-10-alkyl esters, with ≥ 0.3% of dihexyl phthalate	68515-51-5	x	x		x
Dicyclohexyl phthalate (DCHP)	84-61-7	x			x
Diisohexyl phthalate	71850-09-4	x			x
Diisooctyl phthalate (DIOP)	27554-26-3				x

Appendix 9 - PAH - Polycyclic aromatic hydrocarbons

PAH substances listed in Annex XVII, the Candidate List of Substances of Very High Concern for authorization of Regulation (EC) No 1907/2006 (REACH) and/or the French AGEC legislation (LOI n° 2020-105).

Name	CAS RN	Candidate list and AGEC	Annex XVII, Entry 50	Annex XVII, Entry 72	German GS standard
Benzo(a)anthracene	56-55-3	x	x	x	x
Benzo(a)phenanthrene (chrysene)	218-01-9	x	x	x	x
Benzo(a)pyrene	50-32-8	x	x	x	x
Benzo(b)fluoranthene	205-99-2		x	x	x
Benzo(j)fluoranthene	205-82-3		x	x	x
Benzo(k)fluoranthene	207-08-9	x	x	x	x
Dibenzo(a,h)anthracene	53-70-3		x	x	x
Benzo[e]pyrene	192-97-2		x	x	x
Benzo[ghi]perylene	191-24-2	x			x
Anthracene	120-12-7	x			x
Anthracene oil distillation fractions		x			
Fluoranthene	206-44-0	x			x
Phenanthrene	85-01-8	x			x
Pyrene	129-00-0	x			x
Naphthalene	91-20-3				x
Indeno[1,2,3-cd]pyrene	193-39-5				x

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