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Exposure of consumers to chemicals in clothing, textiles and footware

Annankatu 18, P.O. Box 400, FI-00121 Helsinki, Finland | Tel. +358 9 686180 | Fax +358 9 68618210 | echa.europa.eu

Contents

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Introduction

Article 68(2) of REACH provides a simplified procedure, which the Commission may use to restrict substances that meet the criteria for classification as carcinogenic, mutagenic or toxic for reproduction (CMR), categories 1A and 1B on their own, in mixtures or in articles that could be used by consumers. The procedure differs from the standard restriction procedure prescribed in Articles 69 to 73 of REACH. Article 68(2) does not foresee the preparation of an Annex XV Dossier to initiate the restriction process, a public consultation on the proposal, opinions by RAC and SEAC or the consultation of the Forum for Exchange of Information on Enforcement.

The Commission developed criteria for the implementation of Art. 68(2) and reported them in the paper CAC/102/2014[1]. In that paper, it announced the intention to use Art. 68(2) to restrict CMR substances (categories 1A and 1B) in categories of consumer articles where there is a high likelihood of a prolonged – or multiple short-term - exposure of consumers to CMR substances being potentially present in those articles. Textile articles (clothing and footware) were listed as a relevant article category and subsequently chosen for the first restriction to follow this approach. The list of CMR substances (individual substances or groups) in the scope of this proposal will be added as a specific appendix (Appendix 12) to Annex XVII to REACH.

Although the simplified procedure does not foresee the development of an Annex XV dossier, it has been decided to collect available information to substantiate the inclusion of certain substances (see Annex 1) in the proposal. This information includes indications that the substances are present in textiles and, where possible, that they either are released from textiles or otherwise can lead to exposure of consumers. This information does not take the form of a quantitative assessment (and this in any case is not relevant for the non-threshold substances involved (see Annex I of REACH para 6.5)) but instead presents available evidence that consumers may be exposed to the substances in textiles during normal and reasonably foreseeable conditions of use.

The scope of the restriction includes the following article types:

(a) clothing;

(b) textiles, other than clothing, which come into contact with the skin, for a duration similar to clothing, under normal conditions of use;

(c) footwear,

Annex 2 presents a guidance with a non exhaustive lists of products covered and excluded from the restriction.

[1] http://ec.europa.eu/DocsRoom/documents/10045

A number of exisiting restrictions for substances in textiles exist and are detailed in Annex 3.

Groups of substances

The list of substances within scope of the proposal can be found in Annexes 1 and 4, they have been grouped in the following way to simplify the justification of the inclusion of certain substances:

- Classified dyes and carcinogenic amines

  This group contains classified azodyes and other classified arylamines.

- Impurities

  This group includes benzene, benz[a]anthracene, benz[e]acephenanthrylene, benzo[a]pyrene, benzo[e]pyrene, benzo[j]fluoranthene, benzo[k]fluoranthene, chrysene and dibenz[a,h]anthracene.

- Metals

  The metals group includes arsenic,cadmium, chromium, and lead and their compounds.

- Organic compounds:

  This group includes formaldehyde, chlorinated aromatic hydrocarbons, , benzene, phthalates, quinoline and polar aprotic solvents.

The hazards of the substances and other relevant information are also summarised in Annexes 1 and 4.

Public consultation

From 22 October 2015 to 22 March 2016, the Commission services held a public consultation on a possible restriction of hazardous substances (CMR 1A and 1B) in textile articles and clothing for consumer use. Further information can be found here: http://ec.europa.eu/growth/tools-databases/newsroom/cf/itemdetail.cfm?item_id=8299. Unless stated otherwise, any further mention of public consultation in this report refers to this.

The Commission received 120 contributions in the Public Consultation:

- 18 from individual citizens,
- 10 from Public Authorities
- 34 from companies,
- 40 from Industry or Trade Associations,
- 11 from Non-Governmental Organisations,
- 1 from a Trade Union,

- 1 from an Academic/Research Institute,
- 5 from other stakeholders.

Additionally, the Commission received 5 position papers from stakeholders' organisations.

While many of the associations' contributions presented general concerns about the application of Art. 68(2) to a wide category of articles such as textiles and clothing, some stakeholders submitted specific comments on the scope and the list of substances, including the function of the substances and analytical methods. The Commission used those contributions to refine the list of substances to be covered in the restriction and to better define the scope.

In addition, the Commission services held a meeting with experts from MS, industry, textile testing labs and NGOs on 7 February 2017 to discuss certain technical issues related to the proposed restriction. The details can be found here: http://ec.europa.eu/growth/tools-databases/newsroom/cf/itemdetail.cfm?item_id=9088. The workshop was useful to further discuss the scope of the restriction, the feasibility of the limits proposed and the availability of testing methods.

Information to substantiate the inclusion of certain substances in the proposed restriction

Introduction

As previously mentioned, the simplified procedure envisaged by the Commission does not foresee the development of an Annex XV dossier and Article 68(2) does not require a risk assessment of each substance to be carried out. However, it has been decided to collect available information to substantiate the inclusion of certain substances (see Annexes 1 and 4) in the proposal. This available information includes indications that the substances are present in textiles and, where possible, that they either can be released from textiles or otherwise can lead to exposure of consumers.

The following elements have been identified as potentially useful in this context:

- Evidence of the presence of the substance in the products (i.e. the substance has actually been detected in relevant products).
- Inclusion of the substance in voluntary schemes, standards and restricted substances lists for relevant products.
- The substance has a function in the final product.
- The substance has a role in the manufacturing process of relevant products and may be present as a residual of the production process or an impurity in another substance.
- Can the release of the substance be measured (is this measurement by a validated analytical method)?
- Do the properties of the substance (e.g. Kow, volatility, solubility or molecular weight) or of the matrix of the article in which the substance is present indicate that the substance may migrate or be released from the

article? Or, on the contrary, is there an indication of negligible migration potential, because the substance is well bound into the matrix?

- Is there a likelihood for dermal, oral or inhalation exposure due to the normal/reasonably foreseeable conditions of use and disposal of the consumer article?

General exposure information for substances in textile articles

Substances can intentionally or unintentionally remain in the final product following the manufacture and finishing of textiles (and other products). Related specifically to textiles, (KemI, 2014) reported that it is difficult to know exactly which substances are present and to what concentration levels since the supply chains are long and complex, and are often global.

Substances that are present in textile articles can be released through several mechanisms, resulting in exposures of consumers: from direct release of the substance from the articles, or from fibres released during normal wear and tear. Indirect exposures may also occur when textile articles are used and washed, and ultimately are disposed of as waste (KemI, 2014). For the purposes of this restriction, exposure from migration/leaching and during normal wear and tear are the most relevant.

The release mechanisms include migration, leaching, evaporation and particulate releases. The mechanisms are dependent on several factors (KemI, 2014):

- the inherent chemical/physical properties of the substance
- how the substance is incorporated into the textile
- the type of fibre the substance is incorporated in, and
- the handling of the textile

Chemical/physical properties which influence releases are medium to high vapour pressure and water solubility (ECHA, 2012). Substances with a high vapour pressure are prone to evaporate to the air and it is likely that water soluble substances leach to water/sweat/saliva. In addition, lipid solubility can influence the migration to and uptake by the skin. (KemI, 2014).

The release of a substance may occur as the substance itself or in the form of fibre particles with the substance bound to them or both. Particulate releases are due to wear and tear during use and washing of the clothes, and consist of fibre fragments (KemI, 2014).

The mechanism by which a chemical is incorporated into the textile material will influence how it is released. Substances which bind loosely to the material (e.g. plasticisers, stabilising agents, direct dyes) are likely to have high releases during use, while strongly bound substances, e.g. reactive dyes, will have fibre-mediated releases, if unreacted residues have been removed. Residues of process chemical substances or other impurities or contaminants are often loosely bound to the material. The binding affinity can also vary for different fibre types and textile materials. Other factors that can

trigger release include, high humidity, high temperature, outdoor use (UV-radiation) and high physical stress (wear and tear) (KemI, 2014).

The frequent every-day use of textile articles may lead to exposure of people of all ages to the potentially hazardous chemical content in textiles. Human exposures to substances in textiles are mainly by dermal contact but substances might also be released from the textile fibres causing exposure through inhalation or unintentional ingestion of dust (KemI, 2014).

Oral exposure may also occur as a consequence of migration due to sucking, chewing or licking of textiles. This is of particular relevance to children due to their hand to mouth or mouthing behaviour or both (ECHA, 2012). The exposure to children is considered increased if they e.g. place the textile in the mouth and suck or chews on it (Danish Environment Protection Agency, 2003).

Most textile articles, such as clothes and bed linen, are used in close contact with the skin and therefore dermal exposure is the critical pathway for exposure to substances in textile articles. When textile articles are in direct contact with the skin, substances in the textile can migrate from the material and penetrate the skin (KemI, 2014).

Dermal exposure depends on several factors including the type of material and amount of available substance, physicochemical properties of the substance, such as water and fat solubility, skin penetration rate and the characteristics of the exposed area; irritating substances present in the textiles can increase the dermal uptake (Stacey E Anderson & B Jean Meade, 2014).

The exposure of the consumer varies according to the end-use of the textile. This means uses with close bodily contact such as clothes and bed linen will have the highest exposures. The direct exposure from e.g. curtains, table cloths and blankets is estimated to be lower but may involve other routes of exposure like inhalation of either volatile compounds or compounds adsorbed to dust fibres (Danish Environment Protection Agency, 2003).

Specific information related to the inclusion of certain groups of substances in the proposed restriction

1. Classified azo dyes and carcinogenic amines

The following azo dyes and carcinogenic amines are included in the restriction:

- [4-[4,4'-bis(dimethylamino)benzhydrylidene]cyclohexa-2,5-dien-1-ylidene]dimethylammonium chloride; C.I. Basic Violet 3 with ≥ 0,1 % of Michler's ketone (EC no. 202-027-5)
- 1,4,5,8-tetraaminoanthraquinone; C.I. Disperse Blue 1
- Benzenamine, 4,4'-(4-iminocyclohexa-2,5- dienylidenemethylene)dianiline hydrochloride; C.I. Basic Red 9
- 4-chloro-o-toluidinium chloride
- 2-Naphthylammoniumacetate

- 4-methoxy-m-phenylene diammonium sulphate; 2,4-diaminoanisole sulphate
- 2,4,5-trimethylaniline hydrochloride

Introduction

Azo dyes contain one or several azo groups bound to aromatic compounds. Azo dyes are contained in 60% to 80% of all colorants and are used to produce a wide range of fashion products across all fibre types, whether in apparel, footwear or accessories (10 Toxic Chemicals To Avoid In Your Products, 2015). Aromatic amines are used to produce azo dyes, whose chemical structure is more complex than that of the parent amines.

Reason why the substances are included in the scope of the restriction

For the purposes of this restriction, 7 substances have been identified consisting of arylamines, azo dyes and other amines (see Annex 4 for more details). The substances were identified as being relevant for the potential restriction as they were listed as:

- Colorants that can cleave in carcinogenic amines (Bluesign 2013)
- Arylamines having carcinogenic properties (MAK III),
- Category 1 or 2 (Oekotex 2014)

Some azo dyes used to colour textiles may react under certain conditions to produce carcinogenic and allergenic aromatic amines. Entry 43 of Annex XVII of REACH prohibits azocolourants and azodyes which may release 1 or more of the listed 22 carcinogenic aromatic amines in detectable concentrations (i.e. above 30 parts per million [ppm]) in the finished articles or in the dyed components (see Annex 5). They must not be used in textile and leather articles that may come into direct and prolonged contact with the human skin or oral cavity. However, some azodyes and other aromatic amine compounds may also be carcinogenic in their own right.

The main routes of exposure of consumers to azo dyes and their degradation products are oral ingestion (e.g., young children sucking on toys that contain dyed textile or leather garments) and dermal absorption (e.g., sweat and friction cause dyes, contained in clothes worn near the skin, to elute) (Ahlström, Björklund, & Eskilsson, 2005).

The literature indicates that exposure to carcinogenic textile dyes can be relevant for consumers in contact with textile articles (KemI, 2014). Several azo dyes as well as other types of textile dyes such as anilines and anthraquinones, are classified as carcinogenic or mutagenic or both (EU, 2008). A recent study showed that mutagenic reactive type azo dyes can migrate from cotton fibres to artificial sweat in an experimental setting. The dyes were mutagenic in their formulated form whereas the dye/sweat solutions were not found to be mutagenic (Leme, 2014).

Presence of substances in articles

No specific studies have been identified in the literature showing that the substances identified in Annexes 1 and 4 are still used or present in textiles.

Some comments received in the public consultation indicated that these substances might be present in textiles as they are synthetic precursors to pigments/dyes (although of low relevance) and the aromatic amines could be starting product in manufacturing of some azo dyes. One response in the public consultations stated that some of these dyes are used for dyeing PET or cotton fibres. However, other public consultation comments indicated that at least Basic violet 3, Disperse blue 1 and Basic red 9 are not used anymore by European producers and the amines have no function anymore in the synthesis of dyes. However, remaining uses outside the EU and thus the presence in imported products cannot be excluded.

The evidence is therefore equivocal but the presence of the classified azodyes and amines in textiles cannot be excluded.

Information on exposure from textile articles

Direct dyes are used to colour cellulose fibres, such as cotton and viscose materials, indicating that consumers can be highly exposed. Both direct and acid dye molecules bind very loosely to the fibres and can therefore easily migrate from the fabric to, for example, skin and saliva. The majority of the identified direct dyes are classified as carcinogenic, mutagenic or toxic to reproduction (EU, 2008). Many of the identified dyes are either restricted or regulated under REACH or included on the candidate list. A migration rate of dyes in textiles of about 1ng-1µg/cm^2 has been estimated in a 2012 report (BfR, 2012).

It is almost impossible to indicate a specific migration value for textile dyes because the degree of release may vary considerably. In the case of dyes it depends on which dye category, dye content (colour intensity) and fastness are examined on the respective textile substrate. It is also necessary to consider the conditions of wear and dermal absorption (BfR, 2012).

Dermal exposure (external exposure) to dyes during the wearing of textiles was estimated from the amount of dye released in (BfR, 2012). Textiles with varying specific weights and dye content were examined. Between 0.1 and 300 µg dye were extracted from 500 cm^2 of textile sample. For textiles with a high degree of colour fastness releases of < 1 µg per simulated wear event were obtained. When related to the surface area examined or to an equal area of exposed skin, this would mean a surface dose of < 2 ng/cm^2. The highest release rate measured was 0.4 mg per simulated wear event. In this case 0.18 % of the dye was released (migration factor 0.18 %) on the basis of which a surface-related dose of 0.7 µg per cm^2 was calculated (BfR, 2012).

In a dynamic skin model (1 h, 37 °C) using an alkaline perspiration solution, a migration factor of 0.26 % corresponding to a surface related dose of 1.1 µg per cm^2 skin was determined for Palatinenechtmarineblau (Bundesinstitut für Risikobewertung (BfR), 6 July 2012).

Based on the sparse migration data available, the BfR concluded that the external exposure of consumers to dyes from textiles coloured in accordance with state of the art (fastness between 4-5 and 2-3) is between 1 ng and 1 µg per cm^2. Where poor dyeing techniques have been used, release rates may however be considerably higher (Bundesinstitut für Risikobewertung (BfR), 6 July 2012).

In conclusion there is some evidence that exposure occurs to human skin from azodyes and aromatic amines if they are present in textiles.

Conclusion

The 7 substances have been used in dyes for textiles and are still included in several of the voluntary schemes. In addition, there is evidence that they could cause exposure if they were present and are not covered by entry 43 of Annex XVII, thus are relevant for inclusion in this restriction.

2. Impurities

Introduction

A number of potential impurities in textiles have been identified (see Annexes 1 and 4 for more details):

- Benzene
- Benz[a]anthracene
- Benz[e]acephenanthrylene
- Benzo[a]pyrene
- Benzo[e]pyrene
- Benzo[j]fluoranthene
- Benzo[k]fluoranthene
- Chrysene
- Dibenz[a,h]anthracene

Reason why the substances are included in the scope of the restriction

Some Public Consultation responses indicated that these substances have been found as contaminants in mineral oils used as spin finish or as process chemicals in different steps of synthetic fibre production and sometimes may be present in final product. In addition, they may be present in waxes and paraffins used in the sizing process and could be found as impurities in the final product.

Presence in the certification schemes:

- Benzene (Solvent): Bluesign 2013.
- Benz[a]anthracene, Benz[e]acephenanthrylene Benzo[e]pyrene, Benzo[a]pyrene Benzo[j]fluoranthene Benzo[k]fluoranthene Chrysene Dibenz[a,h]anthracene: Bluesign 2013; OEKO TEX 2014.

These substances are also frequently listed in several Restricted substance lists (RSL) by individual companies and sectorial programmes (ZDHC, AFIRM).

Presence of substances in articles

These substances have been identified during the Public Consultation as contaminants in mineral oil used as spin finish, process chemicals in different steps, synthetic fibre production. The substances can be removed, but are sometimes present in final product if process not optimised. Another responise identified that mineral oil-based preparation agents are used for natural and synthetic fibers in fiber and yarn processing as well as in fabric formation. These uses include twisting oils, coning and warping oils, knitting oils, spinning and combing oils, and batching oils. Mineral oils are also used as additives for printing thickeners and in antifoaming agents. Waxes and paraffin are used in the sizing process. Preparation agents, printing thickeners, antifoaming agents, and sizing agents are textile auxiliaries which are removed in the textile manufacturing process by washing processes but may be present as impurities in the final product.

Testing by BEUC members reported in the Public Consultation response indicated PAHs are present in textile parts of toys, children's cloth (e.g. snow suits) and child care articles (e.g. push chair and child restraints).

Information on exposure from textile articles

No information found

Conclusion

The 9 substances are potentially present in articles as impurities and thus are relevant for inclusion in this restriction.

3. Metals

Introduction

Metals occur in textiles due to either the pigments used to colour fibres or from impurities in other materials used. The metals group includes arsenic, cadmium, chromium, and lead compounds (see Annexes 1 and 4 for more details). The following substances have been identified as relevant for textiles:

- Arsenic compounds
- Cadmium compounds
- Chromium compounds
- Lead compounds

Reason why the substances are included in the scope of the restriction

The metal group substances are all prohibited in textiles eligible for the EU-Ecolabel[2] if they exceed the stated concentrations:

- Arsenic 1 mg/kg (or 0.2 mg/kg for products intended for babies or children under 3)
- Cadmium 0.1 mg/kg
- Chromium 2 mg/kg for textiles dyed with metal complexes or 0.5 mg/kg for other textiles (1mg/kg (textiles dyed with metal complexes) or 0.5 mg/kg for other textiles for products intended for babies or children under 3)
- Lead 1 mg/kg (0.2 mg/kg for products intended for babies or children under 3).

The relevant metal/metal compounds are found on several of the voluntary lists:

	Afirm RSL	Bluesign 2013	Oeko Tex 2014
Arsenic compounds	√	√	√
Cadmium compounds	√	√	√
Chromium compounds	√	√	√
Chromium (VI) compounds	√	√	√
Lead compounds	√	√	√

Presence of substances in articles

Arsenic compounds

There appears to be no intentional use of these substances but they may be impurities in other chemicals used in the textile production process. The AFIRM restricted substances list indicates arsenic and its compounds can be used in preservatives, pesticides and defoliants for cotton, synthetic fibres, paints, inks, trims and plastics. It therefore cannot be excluded that arsenic and its compounds are present in textile articles.

Cadmium compounds

There appears to be no intentional use of these substances but they may be impurities in other chemicals used in the textile production process such as some dyes, pigments, colorants. The AFIRM restricted substances list indicates cadmium compounds are used as pigments (especially in red, orange, yellow and green); as a stabiliser for PVC; and in

[2] Commission Decision (EU) 2017/1392 of 25 July 2017 amending Decision 2014/350/EU establishing the ecological criteria for the award of the EU Ecolabel for textile products

fertilizers, biocides and paints. It therefore cannot be excluded that cadmium and its compounds are present in textile articles.

Chromium compounds

There is some intentional use of chromium (VI) compounds as mordants[3] for wool dying. At least one application for authorisation has been received for this use. The relevant CSR states: *The substance is entirely used in industrial installations under strictly controlled conditions. There is no consumer exposure, since Cr (VI) is reduced to Cr (III) in the process. The amount of non-bound Cr (III) in wool is also at low level (< 3 mg/kg wool) and Cr (VI) does not end up in the final products (yarn, fabric) and consequently not to consumer market in detectable amounts (< 0.5 mg/kg wool). The concentration of chromium Cr (VI) bound to products is monitored by sector specific method (ISO 105-E04).* The AFIRM restricted substances list indicates chromium compounds can be used as dyeing additives, dye-fixing agents, colour fastness after-treatments, dyes for wool, silk and polyamide (especially dark shades) and leather tanning. It therefore cannot be excluded that chromium and its compounds are present in textile articles.

Lead compounds

There may be some intentional use of lead compounds (such as certain lead chromates) in dyes, pigments, colorants (see the background document for lead in consumer articles [4]). They may also appear as impurities in other chemicals used in the textile production process. The Afirm restricted substances list indicates lead compounds may be associated with plastics, paints, inks, pigments and surface coatings. It cannot be excluded that lead and its compounds are present in textile articles.

Related to its use in textiles, lead and its compounds are restricted in entry of 63 of Annex XVII with a concentration limit of 0.05% per weight for consumer articles that can be mouthed by children. This is a narrower scope than the current A68(2) proposal and the concentration limit is higher in entry 63 than in this proposal.

Information on exposure from textile articles

Dermal exposure

The metal group substances are all restricted in textiles eligible for the EU Ecolabel as extractable metals; extraction is by ISO 105-E04 (2008) in acid perspiration (1hr at 37°C) and detection by AAS, ICP for all metals except Cr VI, spectrophotometer for Cr VI. They are also regulated in the Toys Safety Directive with limits as specified in Annex II and meansured according to EN 71-3: Specification for migration of certain elements by extraction with dilute HCl and detection by AAS or ICP.

These substances could expose consumers through being dissolving in sweat and then causing dermal exposure. There is limited evidence in the literature of studies demonstrating the concentrations of metals in textiles. In one study reducible chromium

[3] A substance that combines with a dye or stain and thereby fixes it in a material.

[4] https://echa.europa.eu/documents/10162/10a7006f-1342-40ad-8aa3-c28365d0faca, page 27

was measured using artificial sweat. The percentage of metal extraction profit vary according to the extraction conditions, from 32% to 44% for high metal content in dye, and from 28% to 50% for low metal content in dye (Tonetti & Innocenti, 2009). (Sungur & Gülmez, 2015) analysed the concentrations of metals (Al, Cd, Co, Cr, Cu, Fe, Mn, Ni, Pb, Tl, and Zn) in various textile fibres (cotton, acrylic, polyester, nylon, viscose, and polypropylene) of different colours. Heavy metals concentrations in the examined textile fibers after wet digestion were found to be high[5], whereas in the artificial sweat extract they were low. Only lead concentrations in textile fibres analysed after extraction in the artificial sweat solution were found higher than limit values given by Oeko-Tex.

Table 4: Heavy metal contents (mg kg^{-1}) in various textile fibers after extraction in the artificial sweat solution (average of replicates ± standard deviation).

Textile fibers	Cu	Al	Mn	Pb	Cr
Cotton	3.16 ± 0.20	5.52 ± 0.30	1.44 ± 0.09	1.57 ± 0.10	0.11 ± 0.01
Acrylic	2.35 ± 0.14	3.74 ± 0.23	0.35 ± 0.02	1.68 ± 0.10	0.25 ± 0.02
Polyester	2.04 ± 0.13	2.70 ± 0.16	0.39 ± 0.02	1.08 ± 0.07	nd
Nylon	2.01 ± 0.12	2.46 ± 0.16	0.62 ± 0.04	0.74 ± 0.04	nd
Viscose	2.11 ± 0.13	3.18 ± 0.20	0.39 ± 0.02	0.66 ± 0.04	nd
Polypropylene	2.94 ± 0.19	4.70 ± 0.30	0.37 ± 0.02	1.37 ± 0.08	0.37 ± 0.02

nd: not detected.

Figure 1: Table 4 in (Sungur & Gülmez, 2015)

In another study, lead and chromium were detected in various textile fibres after extraction in artificial sweat solution (Matoso & Cadore, 2012). Some further studies (Tuzen, Onal, & Soylak, 2008) (Rezi´c & Steffan, 2007) (Do˘gan, Soylak,, Elc¸i, & Von Bohlen, 2002) also showed concentrations of metals in textiles. High levels of Chromium were found in polyamide dark clothes (605mg/kg) in another study (Rovira, Nadal, Schuhmacher, & Domingo, 2015)

Oral exposure

In addition to dermal exposure, consumers could be exposed to these substances also orally, specifically via mouthing of such articles by children. A test exists for extraction of metals from textiles utilising fake saliva exists but no reports were found of any results from such tests on metals in textiles in the literature.

Conclusion

The metals have some intentional uses in textile processing and may appear as impurities in textiles. They are covered in several of the voluntary schemes and can cause exposure to consumers from dermal contact and oral exposure. Lead substances are already restricted for this use at 0.05% (as they are mouthable by children) in entry 63 of Annex XVII.

[5] Cd (6.05 mg/kg – 11.86 mg/kg); Pb (18.84 mg/kg – 23.44 mg/kg); Cr (0.11 – 0.97 mg/kg)

4. Organic compounds

Introduction

A study identified 36 organic compounds, mainly plasticisers, flame retardants and pigments, with a moderate probability of release from textiles and clothing. Human exposure to these substances could occur through inhalation of volatile substances, direct skin contact with textiles or through sucking and chewing on textiles, although most likely to a lower extent than for the substances with a high probability of release (KemI, 2014).

In addition, the KemI study identified a group of low probability of release substances containing 165 substances, mainly disperse dyestuffs, pigments, plasticisers stabilisers and flame retardants. Many of the identified substances with carcinogenic, mutagenic or reprotoxic properties are either restricted or regulated under REACH (although not specifically in articles) or included on the candidate list. These substances are strongly bound to textile fibres and are likely released in fibre-bound form and can therefore be highly relevant in relation to exposure to dust. Intake of dust has been identified as an important exposure source of small children to e.g. flame retardants, highly fluorinated compounds and phthalates, both in domestic areas and day care centres (KemI, 2014).

4.1 Formaldeyde

Introduction

Formaldehyde is used in several textile processes: after-treatment of substantive dyeing, hardening of casein fibres, as a wool protection agent, anti mould agent and above all as a cross linking agent in resin finishing[6]. Formaldehyde acts as an agent in textile finish resins which contribute to making an easy-care finish. It helps to prevent shrinkage and to make a fabric crease-resistant. Other qualities of textile finish resins include rendering fabric perspiration proof, waterproof and mothproof (10 Toxic Chemicals To Avoid In Your Products, 2015). Formaldehyde is also used in fire retardant furniture treatment[7].

Reason why the substance is included in the scope of the restriction

Because of its volatility, formaldehyde can be released from certain reactive finishing resins used in textiles and clothing articles. Textile dermatitis, caused by formaldehyde, was a significant problem in the past but Member State legislation and voluntary agreements have decreased the frequency of occurance (KemI, 2014).

Formaldehyde is prohibited in ecolabelled textiles (EU Ecolabel, 2014) with a concentration limit of 16 ppm for products for babies and children under 3 years old and those products that are in direct contact with the skin, and 75 ppm for garments with limited skin contact and interior textiles.

Formaldehyde is also covered in the AFIRM Restricted Substances List (75 ppm for adults/children or 16 ppm for babies), Bluesign system substances list (detection

[6] (EURATEX-ETAD-TEGEWA Joint comment on CMR substances – selected for the restriction – final submitted in the public consultation)
[7] Euratex considerations on the scope of CMR restriction in textile and clothing submitted in the public consultation

limit/15ppm for textiles next to skin or babies, 75 ppm for occasional skin contact) and standard 100 by OEKO-TEX (75 ppm for skin contact).

Presence of substances in articles

A public consultation contribution referred to a study where more than 23 000 items were tested and 12.5 % of these qualitative tests were positive for formaldehyde. Out of those, in 70 % of the cases formaldehyde was below 10 mg/kg; in 23% was below 50 mg/kg and in 3 % it was in the range 50-75 mg/kg.

The public consultation has also indicated that formaldehyde can be found in casein buttons.

Considering the many functions of formaldehyde in textiles and clothing and the public consultation contributions, it can be concluded that formaldehyde can be present in articles relevant for the restriction.

Information on exposure from textile articles

Dermal exposure

Dermal exposure to formaldehyde in textiles and clothing has been demonstrated by the number of formaldehyde dermatitis cases seen in the past. The DG Joint Research Centre's Institute for Health and Consumer Protection conducted a European survey on the level of formaldehyde that can be released from textiles which are in direct contact with the skin (Directorate General Joint Research Center, 2007). For all the studied samples the "worst case" scenario was represented by a release of formaldehyde higher than 75 mg/kg. The highest release was 235 mg/kg in a basic perspiration solution

Oral exposure

No specific evidence of exposure found.

Conclusion

Formaldehyde is used in textiles and in some cases has a specific function in the final articles. In addition, there is evidence that it can be released and cause exposure if present, thus it is relevant for inclusion in this restriction. In addition, it may also cause inhalation exposure but that has not been investigated further.

4.2 Chlorinated aromatic hydrocarbons

Introduction

Some chlorinated aromatic hydrocarbons, chlorobenzenes for example, are (or have been) used as dye carriers or levelling agents for dyeing, printing and coating. This is confirmed by the responses given in the public consultation.

Several substances have been identified in this group that are included in the restriction:

- α, α,α,4-tetrachlorotoluene; p-chlorobenzotrichloride
- α, α,α-trichlorotoluene; benzotrichloride
- α-chlorotoluene; benzyl chloride

Presence of substances in articles

A response in the public consolation stated the three mentioned chorotoluenes have a low significance but they can occur as impurities in dyestuffs (at a very low (ppm) level). Another response stated chlorinated toluenes are still used in textile processing, they can occur as impurities in certain textile chemicals as well. If used consumer exposure is possible in small amounts. Monochlorotoluenes also may be used to produce optical brighteners and both mono- and dichlorotoluenes may be used in solvent applications and in dye accelerators for polyester dyeing.

The AFIRM restricted substances lists indlicates chlorobenzenes and chlorotoluenes (chlorinated aromatic hydrocarbons) can be used as carriers in the dyeing process of polyester or wool/ polyester fibres. They can also be used as solvents.

Both a,a,a,4-tetrachlorotoluene and a,a,a-trichlorotoluene are found on Bluesign 2013 and chlorinated benzenes and toluenes are covered by standard 100 by OEKO-TEX.

Overall it is concluded that the presence of the three toluenes included in the restriction cannot be excluded in textiles.

Information on exposure from textile articles

Dermal exposure

No specific evidence of exposure found

Oral exposure

No specific evidence of exposure found

Conclusion

The 3 substances may be found in textiles as impurities and both a,a,a,4-tetrachlorotoluene and a,a,a-trichlorotoluene are still included in one of the voluntary schemes, thus are relevant for inclusion in this restriction.

4.3 Heterocyclic aromatic compounds

Introduction

Quinolines are used in the manufacture of dyes.

Reason why the substances are included in the scope of the restriction

Quinoline is not included in any of the voluntary lists.

Presence of substances in articles

Several studies have detected quinoline (and its derivatives) in textiles. In one study quinoline was detected at quantifiable levels in almost 80% of all the investigated samples and the loss of quinolines was slow (20% after ten washings), demonstrating that significant amounts of the chemicals remain in the clothes for a long time (Luongo G. , 2015).

In another study quinoline and ten quinoline derivatives were determined in 31 textile samples (Luongo, Avagyan, Hongyu, & Östman, 2015). The clothing samples, diverse in

colour, material, brand, country of manufacture, and price, and intended for a broad market, were purchased from different shops in Stockholm, Sweden. Quinoline was found to be the most abundant compound present in almost all of the samples investigated. The average quinoline concentration was around 2 µg/g, with the highest value (24 µg/g) found in a pink top made of 88% polyester.

Information on exposure from textile articles

Dermal exposure

The washout effect of quinoline and some of its derivatives has been investigated. Twenty-seven textile samples were analysed before, as well as after five and ten times of washing. Quinoline, detected in 81 % of the samples with an average concentration of 2.42 µg/g (median 0.21 µg/g). The average decrease in concentration after ten times washing was around 20 % for quinolines. The average emission to household wastewater of quinolines during one washing (5 kg of clothes made from polyester materials) was calculated to 0.24 g, respectively. These results strongly indicate that laundering of clothing textiles can be an important source of release of these compounds to household wastewater and in the end to aquatic environments. It also demonstrates a potential source of human exposure to these chemicals since considerable amounts of the compounds remain in the clothes even after ten times of washing (Östman, Luongo, & Thorsén, 2014).

Oral exposure

There is no evidence related to oral exposure found

Conclusion

There is evidence quinoline or its derivative dyes are found in textiles sourced in the EU and that exposure to the dyes can occur.

4.4 Phthalates

Introduction

Several phthalates have been identified as being relevant for this assessment:

- 1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters (DIHP)
- Bis(2-methoxyethyl) phthalate
- diisopentylphthalate
- Di-n-hexyl phthalate (DnHP)
- Dipentyl phthalate (DPP)

These substances have not been identified as alternatives to Bis(2-ethylhexyl) phthalate, Benzyl butyl phthalate, Dibutyl phthalate and Diisobutyl phthlalate in ECHA's recent restriction proposal on these 4 phthalates. However, they are all used as plasticisers for PVC and in textile processes. They are used as plasticiser for PVC, acrysol screen printing inks, sealants, PU coatings, adhesives, paints. Phthalate plasticisers are typically added at high levels (up to 40% w/w of a substrate) to impart technical functionality.

Presence of substances in articles

Phthalates are covered by many voluntary schemes, including:

- DIHP, DHNUP, DHP, DMEP, DPP: Bluesign 2013
- DINP, DNOP, DIDP, DIHP, DHNUP, DHP, DMEP, DPP: OEKO TEX 2014

Some responses in the Public Consultation indicated that phthalates can be contained as plasticizer in PVC coatings and in pigment prints. They are used in concentrations of at least 1 % (and up to > 30 %).

AFIRM states that Esters of ortho-phthalic acid (phthalates) are a class of organic compound commonly added to plastics to increase flexibility. They are sometimes used to facilitate the moulding of plastic by decreasing its melting temperature. Phthalates can be found in:

- Flexible plastic components (e.g., PVC)
- Print pastes
- Adhesives
- Plastic buttons
- Plastic sleevings
- Polymeric coatings

Information on exposure from textile articles

Dermal exposure

None

Oral exposure

None

Conclusion

The 5 substances have been found in textiles and are included in several voluntary schemes, thus are relevant for inclusion in this restriction.

4.5 Polar aprotic solvents

Introduction

Several polar aprotic solvents have been used as solvents and auxiliaries in textile production. Three substances have been identified for this group:

- DMF
- DMAC
- NMP

Presence of substances in articles

The three aprotic solvents are covered in the following voluntary schemes:

- DMF: Bluesign 2013
- DMAC: Bluesign 2013; OEKO TEX 2014
- NMP: OEKO TEX 2014

Responses in the Public consultation indicated that solvent coated textiles can contain DMF as a residual solvent in acrylic fibers PU and PVC coating. It is also found as an impurity in man-made-fibers and artificial leather.

DMAC is used during the production of elastane/Spandex and acrylic, as a key solvent in wet/dry spinning. Spinning solutions are prepared by dissolving polymer in DMAC, which is extruded through spinnerets to produce elastane fibers.Responses in the Public consultation indicated that DMAC can be contained, as an impurity, in elastane, aramide and acrylic fibers, PU and PVC coating.

NMP is used as a solvent in fiber processing (polymer production, yarn spinning) Responses in the Public consultation indicated that NMP can be contained as residual solvent in aramide fibers.

Information on exposure from textile articles

Dermal exposure

No information found

Oral exposure

No information found

Conclusion

The 3 substances have been found in textiles and are still included in several of the voluntary schemes, thus are relevant for inclusion in this restriction.

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Annex 1: Substances covered in the restriction, limits and possible analytical methods

	Index- Nr.	CAS No.	EC No.	Substances	Concentration limit by weight	Test method
1	605-001-00-5	50-00-0	200-001-8	Formaldehyde	75 mg/kg Formaldehyde in jackets, coats and in upholstery: 300 m/kg until 60 months after the entry into force of the restriction.	**EN ISO 14184-1 (2014)** Textiles - Determination of formaldehyde -Part 1: Free and hydrolysed formaldehyde (water extraction method)
2	-	-	-	Cadmium and its compounds (listed in Annex XVII, Entry 28, 29, 30, Appendices 1-6)	1 mg/kg (expressed as Cd metal that can be extracted from the material)	**EN 16711** Textiles Determination of metal content. Part 1: Determination of metals using microwave digestion Part 2: Determination of metals extracted by acidic artificial perspiration solution
3	-	-	-	Chromium VI compounds (listed in Annex XVII, Entry 28, 29, 30, Appendices 1-6)	1 mg/kg (expressed as Cr VI that can be extracted from the material)	**ISO 105-E04 (2013)** Textiles - Tests for colour fastness -- Part E04: Colour fastness to perspiration **EN ISO 17294-2 (2016)** Water quality -- Application of inductively coupled plasma mass spectrometry (ICP-MS) -- Part 2: Determination of selected

						elements including uranium isotopes
4	-	-	-	Arsenic compounds (listed in Annex XVII, Entry 28, 29, 30, Appendices 1-6)	1 mg/kg (expressed as As metal that can be extracted from the material)	**ISO 105-E04 (2013)** Textiles - Tests for colour fastness -- Part E04: Colour fastness to perspiration **EN ISO 17294-2 (2016)** Water quality -- Application of inductively coupled plasma mass spectrometry (ICP-MS) -- Part 2: Determination of selected elements including uranium isotopes
5	-	-	-	Lead and its compounds (listed in Annex XVII, Entry 28, 29, 30, Appendices 1-6)	1 mg/kg (expressed as Pb metal that can be extracted from the material)	**ISO 105-E04 (2013)** Textiles - Tests for colour fastness -- Part E04: Colour fastness to perspiration **EN ISO 17294-2 (2016)** Water quality -- Application of inductively coupled plasma mass spectrometry (ICP-MS) -- Part 2: Determination of selected elements including uranium isotopes
6	602-093-00-9	5216-25-1	226-009-1	*α, α,α*,4-tetrachlorotoluene; p-chlorobenzotrichloride	1 mg/kg	**DIN 54232** Textiles - Determination of the content of bonds based on chlorobenzene and

						chlorotoluene
7	602-038-00-9	98-07-7	202-634-5	*a, a,a*-trichlorotoluene; benzotrichloride	1 mg/kg	**DIN 54232** Textiles - Determination of the content of bonds based on chlorobenzene and chlorotoluene
8	602-037-00-3	100-44-7	202-853-6	*a*-chlorotoluene; benzyl chloride	1 mg/kg	**DIN 54232 (2010)** Textiles - Determination of the content of bonds based on chlorobenzene and chlorotoluene
9	607-483-00-2	71888-89-6	276-158-1	1,2-benzenedicarboxylic acid; di-C 6-8-branched alkylesters, C 7-rich	1000 mg/kg (individually or in combination with other phthalates in this entry)	**EN ISO 14389:2014** Textiles -Determination of the phthalate content - Tetrahydrofuran method
10	607-228-00-5	117-82-8	204-212-6	Bis(2-methoxyethyl) phthalate	1000 mg/kg (individually or in combination with other phthalates in this entry)	**EN ISO 14389:2014** Textiles -Determination of the phthalate content - Tetrahydrofuran method
11	607-426-00-1	605-50-5	210-088-4	Diisopentylphthalate	1000 mg/kg (individually or in combination with other phthalates in this entry)	**EN ISO 14389:2014** Textiles -Determination of the phthalate content - Tetrahydrofuran method
12	607-426-00-1	131-18-0	205-017-9	Di-*n*-pentyl phthalate (DPP)	1000 mg/kg (individually or in combination with other phthalates in this entry)	**EN ISO 14389:2014** Textiles -Determination of the phthalate content - Tetrahydrofuran method
13	607-702-00-	84-75-3	201-	Di-*n*-hexyl phthalate (DnHP)	1000 mg/kg (individually or in combination with other	**EN ISO 14389:2014** Textiles -Determination of

	1		559-5		phthalates in this entry)	the phthalate content - Tetrahydrofuran method
14	606-021-00-7	872-50-4	212-828-1	*N*-methyl-2-pyrrolidone; 1-methyl-2-pyrrolidone (NMP)	3000 mg/kg	?
15	616-011-00-4	127-19-5	204-826-4	*N,N*-dimethylacetamide (DMAC)	3000 mg/kg	**DIN CEN ISO/TS 16189.**
16	616-001-00-X	68-12-2	200-679-5	*N,N*-dimethylformamide; dimethyl formamide (DMF)	3000 mg/kg	**EN 16778** DMF in protective gloves **DIN CEN ISO/TS 16189:2013** Footwear - Critical substances potentially present in footwear and footwear components - Test method to quantitatively determine dimethylformamide in footwear materials
17	601-020-00-8	71-43-2	200-753-7	Benzene	5 mg/kg	To be identified
18	601-033-00-9	56-55-3	200-280-6	Benz[*a*]anthracene	1 mg/kg	**AFPS GS 2014** Testing and assessment of polycyclic aromatic hydrocarbons (PAHs) in the course of GS mark certification

19	601-034-00-4	205-99-2	205-911-9	Benz[*e*]acephenanthrylene	1 mg/kg	**AFPS GS 2014** Testing and assessment of polycyclic aromatic hydrocarbons (PAHs) in the course of GS mark certification
20	601-032-00-3	50-32-8	200-028-5	benzo[*a*]pyrene; benzo[*def*]chrysene	1 mg/kg	**AFPS GS 2014** Testing and assessment of polycyclic aromatic hydrocarbons (PAHs) in the course of GS mark certification
21	601-049-00-6	192-97-2	205-892-7	Benzo[*e*]pyrene	1 mg/kg	**AFPS GS 2014** Testing and assessment of polycyclic aromatic hydrocarbons (PAHs) in the course of GS mark certification
22	601-035-00-X	205-82-3	205-910-3	Benzo[*j*]fluoranthene	1 mg/kg	**AFPS GS 2014** Testing and assessment of polycyclic aromatic hydrocarbons (PAHs) in the course of GS mark certification
23	601-036-00-5	207-08-9	205-916-6	Benzo[*k*]fluoranthene	1 mg/kg	**AFPS GS 2014** Testing and assessment of polycyclic aromatic hydrocarbons (PAHs) in the course of GS mark

						certification
24	601-048-00-0	218-01-9	205-923-4	Chrysene	1 mg/kg	**AFPS GS 2014** Testing and assessment of polycyclic aromatic hydrocarbons (PAHs) in the course of GS mark certification
25	601-041-00-2	53-70-3	200-181-8	Dibenz[*a,h*]anthracene	1 mg/kg	**AFPS GS 2014** Testing and assessment of polycyclic aromatic hydrocarbons (PAHs) in the course of GS mark certification
26	612-205-00-8	548-62-9	208-953-6	[4-[4,4'-bis(dimethylamino)benzhydrylidene]cyclohex*a*-2,5-dien-1-ylidene]dimethylammonium chloride; C.I. Basic Violet 3 with ≥ 0,1 % of Michler's ketone (EC no. 202-027-5)	50 mg/kg	**DIN 54231:2005** Textiles - Detection Of Disperse Dyestuffs
27	611-032-00-5	2475-45-8	219-603-7	1,4,5,8-tetraaminoanthraquinone; C.I. Disperse Blue 1	50 mg/kg	**DIN 54231:2005** Textiles - Detection Of Disperse Dyestuffs
28	611-031-00-X	569-61-9	209-321-2	Benzenamine, 4,4'-(4-iminocyclohexa-2,5-dienylidenemethylene)dianiline hydrochloride; C.I. Basic Red 9	50 mg/kg	**DIN 54231:2005** Textiles - Detection Of Disperse Dyestuffs
29	612-196-00-0	3165-93-3	221-627-8	4-chloro-*o*-toluidinium chloride	30 mg/kg	**EN ISO 14362:2017** Textiles -- Methods for determination of certain aromatic amines derived

						from azo colorants -- Part 1: Detection of the use of certain azo colorants accessible with and without extracting the fibres
30	612-071-00-0	553-00-4	209-030-0	2-Naphthylammoniumacetate	30 mg/kg	**EN ISO 14362:2017** Textiles -- Methods for determination of certain aromatic amines derived from azo colorants -- Part 1: Detection of the use of certain azo colorants accessible with and without extracting the fibres
31	612-200-00-0	39156-41-7	254-323-9	4-methoxy-*m*-phenylene diammonium sulphate; 2,4-diaminoanisole sulphate	30 mg/kg	**EN ISO 14362:2017** Textiles -- Methods for determination of certain aromatic amines derived from azo colorants -- Part 1: Detection of the use of certain azo colorants accessible with and without extracting the fibres
32	612-197-00-6	21436-97-5	-	2,4,5-trimethylaniline hydrochloride	30 mg/kg	**EN ISO 14362:2017** Textiles -- Methods for determination of certain aromatic amines derived from azo colorants -- Part 1: Detection of the use of certain azo colorants accessible with and without

						extracting the fibres
33	613-281-00-5	91-22-5	202-051-6	Quinoline	50 mg/kg	Extraction with Toluene//GCMS

Annex 2: Guidance on the scope of the restriction

The restriction intends to cover:

- Clothing and related accessories, such as:
  - tops, shirts, blouses,
  - underwear,
  - nightwear,
  - hosiery (e.g. socks, pantyhose, stockings, leggings),
  - trousers, pants,
  - jackets, coats, rain coats, capes,
  - dresses, skirts,
  - suits,
  - sportswear,
  - swimwear (e.g. swimsuits, bikinis, swimming trunks),
  - gloves (including latex gloves not covered by Regulation (EU) 2016/425 of the European Parliament and of the Council on personal protective equipment or Regulation (EU) 2017/745 of the European Parliament and of the Council on medical devices), mittens, muffs,
  - scarves, shawls, stoles,
  - ties, cravats,
  - hats, caps, bonnets, veils,
  - bags, like handbags, backpacks, briefcases,
  - wristwatch straps
  - fancy dress and disguise costumes[8]
- textiles other than clothing which come into contact with the human skin under normal or reasonably foreseeable condition of use to an extent similar to clothing, such as
  - bed linen (e.g. sheets, duvet covers, pillow cases),
  - blankets, throws,
  - upholstery (fabric covering chairs, armchairs and sofas etc.)
  - cushion covers
  - bathrobes, towels
  - re-usable nappies and sanitary towels

[8] If the Toy Safety Directive 2009/48/EC establishes lower limits for the substances covered in this restriction, those limits would apply.

    - sleeping bags
    - yarn and fabrics intended for use by the final consumer
- footwear

Examples of situations where these products are placed on the market for consumer use include their supply or making the products available within the context of a service (e.g. upholstery in the seats of a restaurant, in a public library, public transport, or bedlinen in a hospital).

The following are not intended to be covered by the restriction

- jewellery
- glasses and sunglasses
- curtains
- carpets, mats and rugs
- textile lampshades and wall decorations
- napkins and table linen
- filling materials in chairs, armchairs and sofas
- clothing, related accessories or footwear, or parts thereof, made exclusively of natural leather, fur or hide
- non-textile fasteners or decorative attachments (other than prints) , such as buttons, zips, Velcro, rivets, press studs, clasps or buckles, fasteners, eye(let)s, snap fasteners, toggles, hooks, rings, sequins, beads, pearls, stones, glitter or metallic mesh.
- second hand articles
- disposable nappies and sanitary towels
- articles within the scope of Regulation (EU) 2016/425 of the European Parliament and of the Council on personal protective equipment
- articles within the scope of Regulation (EU) 2017/745 of the European Parliament and of the Council on medical devices

Where different concentration limits are set in other entries in Annex XVII to REACH or in other EU legislation the stricter limits always apply. This refers, amongst other, to the limits set in entry 50 on Polycyclic-aromatic hydrocarbons (PAH) and in the Toy Safety Directive 2009/48/EC.

Annex 3: substances that are currently restricted in clothing, textiles and footware

Entry	Substance	Conditions
4.	Tris (2,3 dibromopropyl) phosphate CAS No 126-72-7	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.
7.	Tris(aziridinyl)phosphinoxide CAS No 545-55-1 EC No 208-892-5	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.
8.	Polybromobiphenyls; Polybrominatedbiphenyls (PBB) CAS No 59536-65-1	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.
20.	Organostannic compounds	5. Dibutyltin (DBT) compounds: (a) Dibutyltin (DBT) compounds shall not be used after 1 January 2012 in mixtures and articles for supply to the general public where the concentration in the mixture or the article, or part thereof, is greater than the equivalent of 0,1 % by weight of tin. (b) Articles and mixtures not complying with point (a) shall not be placed on the market after 1 January 2012, except for articles that were

		already in use in the Community before that date. (c) By way of derogation, points (a) and (b) shall not apply until 1 January 2015 to the following articles and mixtures for supply to the general public: — one-component and two-component room temperature vulcanisation sealants (RTV-1 and RTV-2 sealants) and adhesives, — paints and coatings containing DBT compounds as catalysts when applied on articles, — soft polyvinyl chloride (PVC) profiles whether by themselves or coextruded with hard PVC, — fabrics coated with PVC containing DBT compounds as stabilisers when intended for outdoor applications, — outdoor rainwater pipes, gutters and fittings, as well as covering material for roofing and façades, (d) By way of derogation, points (a) and (b) shall not apply to materials and articles regulated under Regulation (EC) No 1935/2004. 6. Dioctyltin (DOT) compound: (a) Dioctyltin (DOT) compounds shall not be used after 1 January 2012 in the following articles for supply to, or use by, the general public, where the concentration in the article, or part thereof, is greater than the equivalent of 0,1 % by weight of tin: – textile articles intended to come into contact with the skin,

		– gloves, – footwear or part of footwear intended to come into contact with the skin, – wall and floor coverings, – childcare articles, – female hygiene products, – nappies, – two-component room temperature vulcanisation moulding kits (RTV-2 moulding kits). (b) Articles not complying with point (a) shall not be placed on the market after 1 January 2012, except for articles that were already in use in the Community before that date.
43.	Azocolourants and Azodyes	1. Azodyes which, by reductive cleavage of one or more azo groups, may release one or more of the aromatic amines listed in Appendix 8, in detectable concentrations, i.e. above 30 mg/kg (0,003 % by weight) in the articles or in the dyed parts thereof, according to the testing methods listed in Appendix 10, shall not be used, in textile and leather articles which may come into direct and prolonged contact with the human skin or oral cavity, such as: – clothing, bedding, towels, hairpieces, wigs, hats, nappies and other sanitary items, sleeping bags, – footwear, gloves, wristwatch straps, handbags,

		purses/wallets, briefcases, chair covers, purses worn round the neck, – textile or leather toys and toys which include textile or leather garments, – yarn and fabrics intended for use by the final consumer
46.	(a) Nonylphenol C 6 H4(OH)C 9 H 19 CAS 25154-52-3 EC 246-672-0 (b) Nonylphenol ethoxylates (C 2 H 4 O) n C 15 H 24 O	Shall not be placed on the market, or used, as substances or in mixtures in concentrations equal to or greater than 0,1 % by weight for the following purposes: …… (3) textiles and leather processing except: — processing with no release into waste water, — systems with special treatment where the process water is pre-treated to remove the organic fraction completely prior to biological waste water treatment (degreasing of sheepskin);
46a	46a. Nonylphenol ethoxylates (NPE) (C 2 H 4 O) n C 15 H 24 O	1. Shall not be placed on the market after 3 February 2021 in textile articles which can reasonably be expected to be washed in water during their normal lifecycle, in concentrations equal to or greater than 0,01 % by weight of that textile article or of each part of the textile article. 2. Paragraph 1 shall not apply to the placing on the market of second-hand textile articles or of new textile articles produced, without the use of NPE, exclusively from recycled textiles. 3. For the purposes of paragraphs 1 and 2, 'textile article' means any unfinished, semi-finished or finished product which is composed of at least 80 % textile

		fibres by weight, or any other product that contains a part which is composed of at least 80 % textile fibres by weight, including products such as clothing, accessories, interior textiles, fibres, yarn, fabrics and knitted panels.
47	Chromium VI compounds	5. Leather articles coming into contact with the skin shall not be placed on the market where they contain chromium VI in concentrations equal to or greater than 3 mg/kg (0,0003 % by weight) of the total dry weight of the leather. 6. Articles containing leather parts coming into contact with the skin shall not be placed on the market where any of those leather parts contains chromium VI in concentrations equal to or greater than 3 mg/kg (0,0003 % by weight) of the total dry weight of that leather part. 7. Paragraphs 5 and 6 shall not apply to the placing on the market of second-hand articles which were in end-use in the Union before 1 May 2015.
67	DecaBDE	1. Shall not be manufactured or placed on the market as a substance on its own after 2 March 2019. 2. Shall not be used in the production of, or placed on the market in: (a) another substance, as a constituent; (b) a mixture; (c) an article, or any part thereof, in a concentration equal to or greater than 0,1 % by weight, after 2 March 2019. DecaBDE's main use was in textiles

		and plastics.
	PFOA	1. Shall not be manufactured, or placed on the market as substances on their own from 4 July 2020. 2. Shall not, from 4 July 2020, be used in the production of, or placed on the market in: (a) another substance, as a constituent; (b) a mixture; (c) an article, in a concentration equal to or above 25 ppb of PFOA including its salts or 1 000 ppb of one or a combination of PFOA-related substances. 3. Points 1 and 2 shall apply from: (a) 4 July 2022 to: (i)equipment used to manufacture semi-conductors; (ii) latex printing inks. (b) 4 July 2023 to: (i) textiles for the protection of workers from risks to their health and safety; (ii) membranes intended for use in medical textiles, filtration in water treatment, production processes and effluent treatment; (iii) plasma nano-coatings. One of PFOA's main uses was in textiles.

In addition, to these Annex XVII entries, opinions on a restriction on phthalates in articles have been sent to the Commission. A restriction proposal on several PCFAs (PFNA; PFDA; PFUnDA; PFDoDA; PFTrDA; PFTDA) their salts and precursors has been received with a similar scope to PFOA. Lastly, a proposal has been received from Sweden and France on substances meeting the classification criteria as skin sensitisers and skin irritants in textiles.

Annex 4: Additional information on the substances covered in the restriction

Classified Dyes and Carcinogenic Amines

Substance Name	CAS No.	EC No.	Chemical groups	Classification	Other
[4-[4,4'-bis(dimethylamino)benzhydrylidene]cyclohexa-2,5-dien-1-ylidene]dimethylammonium chloride. C.I. Basic Violet 3 with ≥ 0.1 % of Michler's ketone (EC no. 202-027-5)	548-62-9	208-953-6	Arylamine salts	Carc. 1B Acute Tox. 4 * Eye Dam. 1 Aquatic Acute 1 Aquatic Chronic 1	SVHC (candidate list) 1 registration (individual: 1-10 tonnes):
1,4,5,8-tetraaminoanthraquinone Disperse Blue 1	2475-45-8	219-603-7	Azo-compound	Carc. 1B Skin Irrit. 2 Eye Dam. 1 Skin Sens. 1	Preregistered with envisaged deadline of 30/11/2010.

Substance Name	CAS No.	EC No.	Chemical groups	Classification	Other
Benzenamine, 4-[(4-aminophenyl)(4-imino-2,5-cyclohe1adien-1-ylidene)methyl]-, monohydrochloride Basic Red 9	569-61-9	209-321-2	Azo-compound	Carc. 1B	Preregistered with envisaged deadline of 30/11/2010.
4-chloro-o-toluidinium chloride	3165-93-3	221-627-8	Azo-compound	Carc. 1B Muta. 2 Acute Tox. 3 * Acute Tox. 3 * Acute Tox. 3 * Aquatic Acute 1 Aquatic Chronic 1	Preregistered with envisaged deadline of 30/11/2010.
2-Naphthylammoniumacetate	553-00-4	209-030-0	Arylamine salts	Carc. 1A Acute Tox. 4 * Aquatic Chronic 2	Preregistered with envisaged deadline of 30/11/2010.

Substance Name	CAS No.	EC No.	Chemical groups	Classification	Other
4-methoxy-m-phenylenediammonium sulphate 2,4-diaminoanisole sulphate	39156-41-7	254-323-9	Arylamine salts	Carc. 1B Muta. 2 Acute Tox. 4 * Aquatic Chronic 2	Preregistered with envisaged deadline of 30/11/2010.
2,4,5-trimethylaniline hydrochloride	21436-97-5	-	Arylamine salts; aniline salts	Carc. 1B Acute Tox. 3 * Acute Tox. 3 * Acute Tox. 3 * Aquatic Chronic 2	Not preregistered.

Impurities

Substance Name	CAS No.	EC No.	Chemical groups	Function	Classification	Other
Benzene	71-43-2	200-753-7	Aromatic hydrocarbons	Impurity	Flam. Liq. 2 Carc. 1A Muta. 1B STOT RE 1 Asp. Tox. 1 Eye Irrit. 2 Skin Irrit. 2	SVHC (candidate list) 2 registrations (intermediate/joint).
Benz[a]anthracene	56-55-3	200-280-6	Polyaromatic Hydrocarbons (PAHs)	Impurity	Carc. 1B Aquatic Acute 1 Aquatic Chronic 1	Preregistered with envisaged deadline of 30/11/2010.
Benz[e]acephenanthrylene	205-99-2	205-911-9	Polyaromatic Hydrocarbons (PAHs)	Impurity	Carc. 1B Aquatic Acute 1 Aquatic Chronic 1	Preregistered with envisaged deadline of 30/11/2010.
Benzo[a]pyrene	50-32-8	200-028-5	Polyaromatic Hydrocarbons (PAHs)	Impurity	Carc. 1B Muta. 1B Repr. 1B Skin	Preregistered with envisaged deadline of

Substance Name	CAS No.	EC No.	Chemical groups	Function	Classification	Other
					Sens. 1 Aquatic Acute 1 Aquatic Chronic 1	30/11/2010.
Benzo[e]pyrene	192-97-2	205-892-7	Polyaromatic Hydrocarbons (PAHs)	Impurity	Carc. 1B Aquatic Acute 1 Aquatic Chronic 1	Preregistered with envisaged deadline of 30/11/2010.
Benzo[j]fluoranthene	205-82-3	205-910-3	Polyaromatic Hydrocarbons (PAHs)	Impurity	Carc. 1B Aquatic Acute 1 Aquatic Chronic 1	Preregistered with envisaged deadline of 30/11/2010.
Benzo[k]fluoranthene	207-08-9	205-916-6	Polyaromatic Hydrocarbons (PAHs)	Impurity	Carc. 1B Aquatic Acute 1 Aquatic Chronic 1	Preregistered with envisaged deadline of 30/11/2010.
Chrysene	218-01-9	205-923-4	Polyaromatic Hydrocarbons (PAHs)	Impurity	Carc. 1B Muta. 2 Aquatic Acute 1	Preregistered with envisaged deadline of

Substance Name	CAS No.	EC No.	Chemical groups	Function	Classification	Other
					Aquatic Chronic 1	30/11/2010.
Dibenz[a,h]anthracene	53-70-3	200-181-8	Polyaromatic Hydrocarbons (PAHs)	Impurity	Carc. 1B Aquatic Acute 1 Aquatic Chronic 1	Preregistered with envisaged deadline of 30/11/2010.

Metals

Arsenic compounds (listed in Annex XVII, Entry 28, 29, 30, Appendices 1-6)

Substance name	EC number	CAS number	Classification
Trinickel bis(arsenate); Nickel (II) arsenate	236-771-7	13477-70-8	Skin Sens. 1 Carc. 1A STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1
Trinickel bis(arsenite)	-	74646-29-0	Skin Sens. 1 STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1 Carc. 1A
Nickel diarsenide	235-103-1	12068-61-0	Skin Sens. 1 STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1 Carc. 1A
Nickel arsenide	248-169-1	27016-75-7	Skin Sens. 1 STOT RE 1 Aquatic Acute 1

Substance name	EC number	CAS number	Classification
			Aquatic Chronic 1 Carc. 1A
Trinickel bis(arsenate); Nickel (II) arsenate	236-771-7	13477-70-8	Skin Sens. 1 Carc. 1A STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1
Nickel diarsenide;	235-103-1	12068-61-0	Skin Sens. 1 STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1 Carc. 1A
Nickel arsenide;	248-169-1	27016-75-7	Skin Sens. 1 STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1 Carc. 1A
Diarsenic trioxide; arsenic trioxide	215-481-4	1327-53-3	Acute Tox. 2 * Skin Corr. 1B Carc. 1A

Substance name	EC number	CAS number	Classification
			Aquatic Acute 1 Aquatic Chronic 1
Arsenic pentoxide; arsenic oxide	215-116-9	1303-28-2	Acute Tox. 3 Acute Tox. 3 Carc. 1A Aquatic Acute 1 Aquatic Chronic 1
Arsenic acid and its salts with the exception of those specified elsewhere in this Annex	-	-	Acute Tox. 3* Acute Tox. 3* Carc. 1A Aquatic Acute 1 Aquatic Chronic 1
Triethyl arsenate	427-700-2	15606-95-8	Acute Tox. 3 * Acute Tox. 3 * Carc. 1A Aquatic Acute 1 Aquatic Chronic 1

Cadmium and its compounds (listed in Annex XVII, Entry 28, 29, 30, Appendices 1-6)

Substance name	EC number	CAS number	Classification
Cadmium oxide	215-146-2	1306-19-0	Acute Tox. 2* Muta. 2 Carc. 1B STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1 Repr. 2
Cadmium fluoride	232-222-0	7790-79-6	Acute Tox. 3* Carc. 1B; STOT RE 1 STOT RE 2: Acute Tox. 2 * Muta. 1B Carc. 1B STOT RE 1 Aquatic Acute 1

Substance name	EC number	CAS number	Classification
			Aquatic Chronic 1 Repr. 1B
Cadmium chloride	233-296-7	10108-64-2	Acute Tox. 3* STOT RE 2 Carc. 1B STOT RE 1 Acute Tox. 2* Muta. 1B Carc. 1B STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1 Repr. 1B
Cadmium sulphate	233-331-6	10124-36-4	Acute Tox. 3* Carc. 1B STOT RE 2 STOT RE 1

Substance name	EC number	CAS number	Classification
			Acute Tox. 2* Muta. 1B Carc. 1B STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1 Repr. 1B
Cadmium sulphide	215-147-8	1306-23-6	Acute Tox. 4* STOT RE 1 STOT RE 2 Muta. 2 Carc. 1B STOT RE 1 Aquatic Chronic 4 Repr. 2
Cadmium (pyrophoric)	231-152-8	7440-43-9	Pyr. Sol. 1 Acute Tox. 2*

Substance name	EC number	CAS number	Classification
			Muta. 2 Carc. 1B STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1 Repr. 2

Chromium VI compounds (listed in Annex XVII, Entry 28, 29, 30, Appendices 1-6)

Substance name	EC number	CAS number	Classification
Chromium (VI) trioxide	215-607-8	1333-82-0	Ox. Sol. 1 STOT SE 3 Acute Tox. 3* Acute Tox. 3* Skin Corr. 1A Skin Sens. 1 Acute Tox. 2* Resp. Sens. 1

Substance name	EC number	CAS number	Classification
			Muta. 1B Carc. 1A STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1 Repr. 2
Zinc chromates including zinc potassium chromate			Acute Tox. 4* Skin Sens. 1 Carc. 1A Aquatic Acute 1 Aquatic Chronic 1
Nickel chromate	238-766-5	14721-18-7	Skin Sens. 1 Resp. Sens. 1 STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1

Substance name	EC number	CAS number	Classification
			Carc. 1A
Nickel dichromate	239-646-5	15586-38-6	Skin Sens. 1 Skin Sens. 1 STOT RE 1 STOT RE 2 Resp. Sens. 1 Muta. 2 STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1 Carc. 1A Repr. 1B
Chromyl dichloride; chromic oxychloride	239-056-8	14977-61-8	Ox. Liq. 1 STOT SE 3 Eye Irrit. 2 Skin Corr. 1A

Substance name	EC number	CAS number	Classification
			Skin Corr. 1B Skin Sens. 1 Skin Irrit. 2 Skin Corr. 1A Skin Sens. 1 Muta. 1B Aquatic Acute 1 Aquatic Chronic 1 Carc. 1B
Potassium chromate	232-140-5	7789-00-6	Skin Irrit. 2 Skin Sens. 1 Eye Irrit. 2 Skin Sens. 1 STOT SE 3 Muta. 1B Aquatic Acute 1 Aquatic Chronic 1

Substance name	EC number	CAS number	Classification
			Carc. 1B
Calcium chromate	237-366-8	13765-19-0	Acute Tox. 4* Carc. 1B H350 Aquatic Acute 1 Aquatic Chronic 1
Strontium chromate	232-142-6	7789-06-2	Acute Tox. 4* Carc. 1B Aquatic Acute 1 Aquatic Chronic 1
Chromium III chromate; chromic chromate	246-356-2	24613-89-6	Ox. Sol. 1 Skin Corr. 1A Skin Sens. 1 Carc. 1B Aquatic Acute 1 Aquatic Chronic 1
Chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in Annex VI			Skin Sens. 1

Substance name	EC number	CAS number	Classification
to Regulation (EC) No 1272/2008			Aquatic Acute 1 Aquatic Chronic 1 Carc. 1B
Potassium dichromate	231-906-6	7778-50-9	Ox. Sol. 2 STOT SE 3 Acute Tox. 3* Acute Tox. 4* Skin Corr. 1B Skin Sens. 1 Acute Tox. 2* Resp. Sens. 1 Muta. 1B Carc. 1B STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1 Repr. 1B
Ammonium dichromate	232-143-1	7789-09-5	Ox. Sol. 2**** STOT SE 3 Resp. Sens. Skin Sens

Substance name	EC number	CAS number	Classification
			Acute Tox. 3* Acute Tox. 4* Skin Corr. 1B Skin Sens. 1 Acute Tox. 2* Resp. Sens. 1 Muta. 1B Carc. 1B STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1 Repr. 1B
Sodium dichromate	234-190-3	10588-01-9	Ox. Sol. 2 Resp. Sens. 1 Skin Sens. 1 STOT SE 3 Acute Tox. 3* Acute Tox. 4* Skin Corr. 1B Skin Sens. 1 Acute Tox. 2* Resp. Sens. 1

Substance name	EC number	CAS number	Classification
			Muta. 1B Carc. 1B STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1 Repr. 1B
Chromyl dichloride; chromic oxychloride	239-056-8	14977-61-8	Ox. Liq. 1 STOT SE 3 Eye Irrit. 2 Skin Corr. Skin Corr. 1B Skin Sens. 1 Skin Irrit. 2 Skin Corr. 1A Skin Sens. 1 Muta. 1B Aquatic Acute 1 Aquatic Chronic 1 Carc. 1B
Potassium chromate	232-140-5	7789-00-6	Skin Irrit. 2 Skin Sens. 1 Eye Irrit. 2

Substance name	EC number	CAS number	Classification
			Skin Sens. 1 STOT SE 3 Muta. 1B Aquatic Acute 1 Aquatic Chronic 1 Carc. 1B
Sodium chromate	231-889-5	7775-11-3	Acute Tox. 3* Resp. Sens Skin Sens. Acute Tox. 4* Skin Corr. 1B Skin Sens. 1 Acute Tox. 2* Resp. Sens. 1 Muta. 1B Carc. 1B STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1 Repr. 1B
Nickel dichromate	239-646-5	15586-38-6	Skin Sens. 1 Skin Sens. 1

Substance name	EC number	CAS number	Classification
			STOT RE 1 STOT RE 2 Resp. Sens. 1 Muta. 2 STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1 Carc. 1A Repr. 1B

Lead and its compounds (listed in Annex XVII, Entry 28, 29, 30, Appendices 1-6)

Substance name	EC number	CAS number	Classification
Lead hydrogen arsenate	232-064-2	7784-40-9	Acute Tox. 3 * Acute Tox. 3 * Carc. 1A STOT RE 2 * Aquatic Acute 1 Aquatic Chronic 1 Repr. 1A
Lead chromate	231-846-0	7758-97-6	Carc. 1B STOT RE 2

Substance name	EC number	CAS number	Classification
			Aquatic Acute 1 Aquatic Chronic 1 Repr. 1A
Lead sulfochromate yellow; C.I. Pigment Yellow 34; [This substance is identified in the Colour Index by Colour Index Constitution Number, C.I. 77603.]	215-693-7	1344-37-2	Carc. 1B STOT RE 2 Aquatic Acute 1 Aquatic Chronic 1 Repr. 1A
Lead chromate molybdate sulfate red; C.I. Pigment Red 104; [This substance is identified in the Colour Index by Colour Index Constitution Number, C.I. 77605.]	235-759-9	12656-85-8	Carc. 1B STOT RE 2 Aquatic Acute 1 Aquatic Chronic 1 Repr. 1A
Lead hexafluorosilicate	247-278-1	25808-74-6	Acute Tox. 4 * Acute Tox. 4 * STOT RE 2 * Aquatic Acute 1 Aquatic Chronic 1

Substance name	EC number	CAS number	Classification
			Repr. 1A
Lead compounds with the exception of those specified elsewhere in this Annex			Acute Tox. 4 * STOT RE 2 Repr. 2 Acute Tox. 4 * STOT RE 2 * Aquatic Acute 1 Aquatic Chronic 1 Repr. 1A
Lead alkyls			Acute Tox. 2 * Repr. 1A STOT RE 2 Acute Tox. 1 Acute Tox. 2 * STOT RE 2 * Aquatic Acute 1 Aquatic Chronic 1 Repr. 1A
Lead azide	236-542-1	13424-46-9	Unst. Expl. Acute Tox. 4 * Acute Tox. 4 * STOT RE 2 * Aquatic Acute 1

Substance name	EC number	CAS number	Classification
			Aquatic Chronic 1 Repr. 1A
Lead di(acetate)	206-104-4	301-04-2	STOT RE 2 * Aquatic Acute 1 Aquatic Chronic 1 Repr. 1A
Trilead bis(orthophosphate)	231-205-5	7446-27-7	STOT RE 2 * Aquatic Acute 1 H400 Aquatic Chronic 1 H410 H410 Repr. 1A
Lead acetate	215-630-3	1335-32-6	Carc. 2 STOT RE 2 * Aquatic Acute 1 Aquatic Chronic 1 Repr. 1A
Lead(II) methanesulphonate	401-750-5	17570-76-2	Acute Tox. 4* Skin Irrit. 2 Eye Dam. 1 Acute Tox. 4* STOT RE 2* Repr. 1A
Lead 2,4,6-trinitroresorcinoxide, lead	239-290-0	15245-44-0	Expl. 1.1

Substance name	EC number	CAS number	Classification
styphnate			Acute Tox. 4* Acute Tox. 4* STOT RE 2* Aquatic Acute 1 Aquatic Chronic 1 Repr. 1A

Organic substances

Formaldehyde

Substance Name	CAS No.	EC No.	Chemical groups	Function	Classification	Other information
Formaldehyde	50-00-0	200-001-8	Aldehydes	Several processes: after treatment of substantive dyeing, hardening of casein fibres, as a wool protection agent, anti	Carc. 1B Muta. 2 Acute Tox. 3* Acute Tox. 3* Acute Tox. 3* Skin Corr. 1B Skin Sens. 1	1 registration (joint)

Substance Name	CAS No.	EC No.	Chemical groups	Function	Classification	Other information
				mould and above all as a cross linking agent in resin finishing. Solvents, pesticides, easy-care.		

Chlorinated aromatic hydrocarbons

Substance Name	CAS No.	EC No.	Chemical groups	Function	Classification	Other information
a,a,a,4-tetrachlorotoluene	5216-25-1	226-009-1	Chlorinated aromatic Hydrocarbons	Carrier	Carc. 1B Repr. 2 STOT RE 1 Acute Tox. 4 * Acute Tox. 4 *	2 registrations (intermediate).

Substance Name	CAS No.	EC No.	Chemical groups	Function	Classification	Other information
					STOT SE 3 Skin Irrit. 2	
a,a,a-trichlorotoluene	98-07-7	202-634-5	Chlorinated aromatic Hydrocarbons	Carrier	Carc. 1B Acute Tox. 3 * Acute Tox. 4 * STOT SE 3 Skin Irrit. 2 Eye Dam. 1	1 registrations (intermediate).
a-chlorotoluene	100-44-7	202-853-6	Chlorinated aromatic hydrocarbons	NA	Carc. 1B Acute Tox. 3 * Acute Tox. 4 * STOT RE 2 * STOT SE 3 Skin Irrit. 2 Eye Dam. 1	1 registrations (joint).

Phthalates

Substance Name	CAS No.	EC No.	Chemical groups	Function	Classification	Other information
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C 7-rich	71888-89-6	276-158-1	Phthalates	Plasticizers	Repr. 1B	SVHC (candidate list) Preregistered with envisaged deadline of 30/11/2010.
Bis(2-methoxyethyl) phthalate	117-82-8	204-212-6	Phthalates	Plasticizers	Repr. 1B	SVHC (candidate list)Preregistered with envisaged deadline of 30/11/2010.
diisopentylphthalate	605-50-5	210-088-4	Phthalates	Plasticizers	Repr. 1B Aquatic Acute 1	SVHC (candidate list) 1 registration (joint).
Di-n-hexyl phthalate (DnHP)	84-75-3	201-559-5	Phthalates	Plasticizers	Repr. 1B	SVHC (candidate list)Preregistered with envisaged deadline of 30/11/2010.
Dipentyl phthalate (DPP)	131-18-0	205-017-9	Phthalates	Plasticizers	Repr. 1B Aquatic Acute 1	SVHC (candidate list)Preregistered with envisaged deadline of 30/11/2010.

Polar aprotic solvents

Substance Name	CAS No.	EC No.	Chemical groups	Functional Groups	Classification	Other information
Dimethylformamide (DMF)	68-12-2	200-679-5	Polar aprotic solvents	Solvents, auxiliaries	Repr. 1B Acute Tox. 4 * Acute Tox. 4 * Eye Irrit. 2	SVHC (candidate list) 2 registrations (intermediate/joint).
N,N-dimethylacetamide (DMAC)	127-19-5	204-826-4	Polar aprotic solvents	Solvents	Repr. 1B Acute Tox. 4 * Acute Tox. 4 *	SVHC (candidate list) 1 registration (joint).
N-methyl-2-pyrrolidone; 1-methyl-2-pyrrolidone (NMP)	872-50-4	212-828-1	Polar aprotic solvents	Solvents, auxiliaries	Repr. 1B Eye Irrit. 2 STOT SE 3 Skin Irrit. 2	SVHC (candidate list) 1 registration (joint).

Quinoline

Substance Name	CAS No.	EC No.	Chemical groups Reason for lisitng	Function	Classification	Other information
Quinoline	91-22-5	613-281-00-5	Quinoline	Carrier	Acute Tox. 4* Acute Tox. 4* Skin Irrit. 2 Eye Irrit. 2 Muta. 2 Carc. 1B Aquatic Chronic 2	4 registrations (joint/intermediate).

Annex 5: List of aromatic amines and azodyes identified in Annex XVII

List of aromatic amines (CAS No.; EC No.):

- biphenyl-4-ylamine 4-aminobiphenyl xenylamine (92-67-1; 202-177-1)
- benzidine (92-87-5; 202-199-1)
- 4-chloro-o-toluidine (95-69-2; 202-441-6)
- 2-naphthylamine (91-59-8; 202-080-4)
- o-aminoazotoluene 4-amino-2',3-dimethylazobenzene 4-o-tolylazo-o-toluidine (97-56-3; 202-591-2)
- 5-nitro-o-toluidine (99-55-8; 202-765-8)
- 4-chloroaniline (106-47-8; 203-401-0)
- 4-methoxy-m-phenylenediamine (615-05-4; 210-406-1)
- 4,4'-methylenedianiline 4,4'-diaminodiphenylmethane (101-77-9; 202-974-4)
- 3,3'-dichlorobenzidine 3,3'-dichlorobiphenyl-4,4'-ylenediamine (91-94-1; 202-109-0)
- 3,3'-dimethoxybenzidine o-dianisidine (119-90-4; 204-355-4)
- 3,3'-dimethylbenzidine 4,4'-bi-o-toluidine (119-93-7; 204-358-0)
- 4,4'-methylenedi-o-toluidine (838-88-0; 212-658-8)
- 6-methoxy-m-toluidine p-cresidine (120-71-8; 204-419-1)
- 4,4'-methylene-bis-(2-chloro-aniline) 2,2'-dichloro-4,4'-methylene-dianiline (101-14-4; 202-918-9)
- 4,4'-oxydianiline (101-80-4; 202-977-0)
- 4,4'-thiodianiline (139-65-1; 205-370-9)
- o-toluidine 2-aminotoluene (95-53-4; 202-429-0)
- 4-methyl-m-phenylenediamine (95-80-7202-453-1)
- 2,4,5-trimethylaniline (137-17-7; 205-282-0)
- o-anisidine 2-methoxyaniline (90-04-0; 201-963-1)
- 4-amino azobenzene (60-09-3; 200-453-6)

List of azodyes:

- A mixture of: disodium (6-(4-anisidino)-3-sulfonato-2-(3,5-dinitro-2-oxidophenylazo)-1-naphtholato)(1-(5-chloro-2-oxidophenylazo)-2-naphtholato)chromate(1-); trisodium bis(6-(4-anisidino)-3-sulfonato-2-(3,5-dinitro-2-oxidophenylazo)-1-naphtholato)chromate(1-) (EC No: 405-665-4) Component 1: C39H23ClCrN7O12S.2Na (CAS-No: 118685-33-9)/Component 2: C46H30CrN10O20S2.3Na