

ZDHC Manufacturing Restricted Substances List

Version 2.0

Signatory Brands



Chemical Industry



Solution Provider



Textile and Footwear Industry



Associates



1 Background

The ZDHC Manufacturing Restricted Substances List (ZDHC MRSL) is a list of chemical substances. These substances are banned from intentional use in facilities processing textile materials, leather, rubber, foam, adhesives and trim parts in textiles, apparel, and footwear. Using chemical formulations that conform to the ZDHC MRSL allows suppliers to assure themselves, and their customers, that banned chemical substances are not intentionally used during production and manufacturing processes.

The ZDHC MRSL goes beyond the traditional approaches to chemical restrictions, which only apply to finished products (Product Restricted Substances List - PRSL). This approach helps to protect consumers while minimising the possible impact of banned hazardous chemicals on production workers, local communities, and the environment.

Chemical formulations covered by restrictions in the ZDHC MRSL include, but are not limited to, cleaners, adhesives, paints, inks, detergents, dyes, colourants, auxiliaries, coatings and finishing agents used during raw material production, wet processing, process machinery maintenance, wastewater treatment, sanitation, and pest control. ZDHC MRSL limits apply to substances in commercially available formulations, not those from earlier stages of chemical synthesis.

The ZDHC Foundation Roadmap to Zero Programme would like to acknowledge the vital role of the experts comprising the MRSL Advisory Council who independently and objectively evaluated the proposed compound additions to the MRSL and made the decision on the compounds added to this version of the ZDHC MRSL.

2 Purpose

The ZDHC MRSL offers brands and suppliers a single, harmonised list of chemical substances banned from intentional use during manufacturing and related processes in supply chains of the textile, apparel, and footwear (including leather and rubber) industries (the Industry).

Version 2.0 applies to textiles, leather, rubber, foam and adhesives, recognising that these materials use different processes. Filters for each material ensure limits reflect the processes.

3 Notes

The information in this ZDHC MRSL V2.0 is provided for information only. Whilst ZDHC takes every reasonable effort to make sure that the information is as accurate as possible, ZDHC makes no claims, promises, or guarantees about the accuracy, completeness, or adequacy of the contents of this document.

"Meeting the requirements of the ZDHC MRSL V2.0 does not

- a) replace applicable national environmental or workplace safety restrictions. Worker exposure to chemical substances listed in this document, along with other hazardous substances, must not exceed occupational exposure limits
- b) guarantee compliance with or take the place of legal or regulatory requirements relating to the use, storage, and transport of chemical products."

The ZDHC MRSL V2.0 does not replace legal or brand-specific restrictions on hazardous substances in finished products, including the material components of them.

4 DISCLAIMERS

In no event will ZDHC (and/or any related ZDHC majority owned legal entities) or the Directors or staff thereof be liable and ZDHC expressly disclaims any liability of any kind to any party for any loss, damage, or disruption caused

- a) by errors or omissions, whether such errors or omissions result from negligence, accident, or any other cause and/or
- b) from any use, decision made, action taken, or any other kind of reliance on the ZDHC MRSL V2.0 by a reader or user of it and/or
- c) for any results obtained or not obtained from the use of the ZDHC MRSL V2.0
- d) by any updates to the ZDHC MRSL V2.0

5 ZDHC MRSL Chapters

5.1 Chapter 1: ZDHC MRSL

This applies to chemical formulations and substances used during creation and wet processing of textile fibres, and during creation and processing of (coated) fabrics, leather, rubber, foam and adhesives.

Group A: Supplier Guidance

Group A substances are banned from intentional use in facilities that process raw materials and manufacture finished products.

Group B: Formulation Limit

Group B substances are restricted to concentration limits in chemical formulations commercially available from chemical suppliers. These limits ban intentional use while allowing for reasonable expected manufacturing impurities, which should be consistently achievable by responsible chemical manufacturers.

5.2 Chapter 2: ZDHC MRSL Candidate List

Found in Chapter 2 of the ZDHC MRSL. Proposed ZDHC MRSL additions can meet listing criteria, as described in the Principles and Procedures, yet lack safer alternatives at scale. Including such substances on the Candidate List encourages the innovation of alternatives.

5.3 Chapter 3: ZDHC Archived Substances

Archived substances, or those without strong evidence of current use in Industry, but with clear evidence of historical use.

5.4 Process for ZDHC MRSL Revision

The ZDHC MRSL is a living document. It is updated as needed to expand the materials and processes covered and to add substances that should be phased out of the value chain. The Principles and Procedures document contains and explains the process used to update the ZDHC MRSL. Part of this process allows anyone to submit suggested changes to it. This includes the limits for existing compounds, the addition of new compounds, or delisting compounds through the ZDHC MRSL Submission Platform, which will be launched in the coming months.

[ZDHC MRSL Update Principles and Procedures](#)

5.5 Transition Period

After the release of a new version of the ZDHC MRSL a transition period applies. This lets the Industry prepare for implementation of the new version. The current transition period is twelve months, beginning on January 1st 2020. During this time, both versions of the ZDHC MRSL remain active and it's possible to certify against them.

[MRSL Industry Standard Implementation Approach](#)

Alkylphenol (AP) and Alkylphenol Ethoxylates (APEOs): including all isomers

Potential Uses in Apparel and Footwear Textile Processing

APEOs can be used as or found in: detergents, scouring agents, spinning oils, wetting agents, softeners, emulsifier/dispersing agents for dyes and prints, impregnating agents, de-gumming for silk production, dyes and pigment preparations, polyester padding and down/feather fillings.

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|--|------------------------------------|--|--|-------------------------------|--|
| 104-40-5 11066-49-2 25154-52-3 84852-15-3 | Nonylphenol (NP), mixed isomers | Textile Leather Polymers (R,F,A)* | No intentional use No intentional use No intentional use | 250 ppm 250 ppm 250 ppm | Liquid chromatography-mass spectrometry (LC-MS), gas chromatography-mass spectrometry (GC-MS) |
| 9016-45-9 26027-38-3 37205-87-1 68412-54-4 127087-87-0 | Nonylphenoethoxylates (NPEO) | Textile Leather Polymers (R,F,A)* | No intentional use No intentional use No intentional use | 500 ppm 500 ppm 500 ppm | Liquid chromatography-mass spectrometry (LC-MS), gas chromatography-mass spectrometry (GC-MS) |
| 9002-93-1 9036-19-5 68987-90-6 | Octylphenoethoxylates (OPEO) | Textile Leather Polymers (R,F,A)* | No intentional use No intentional use No intentional use | 500 ppm 500 ppm 500 ppm | Liquid chromatography-mass spectrometry (LC-MS), gas chromatography-mass spectrometry (GC-MS) |
| 140-66-9 1806-26-4 27193-28-8 | Octylphenol (OP), mixed isomers | Textile Leather Polymers (R,F,A)* | No intentional use No intentional use No intentional use | 250 ppm 250 ppm 250 ppm | Liquid chromatography-mass spectrometry (LC-MS), gas chromatography-mass spectrometry (GC-MS) |

Anti- Microbials & Biocides

Potential Uses in Apparel and Footwear Textile Processing

These substances have biocidal properties, making it useful for Multiple preservation applications.

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|-----------|-------------------------|-------------------|--------------------|--|--|
| 90-43-7 | o-Phenylphenol (+salts) | Textile | No intentional use | 5000 ppm | Solvent extraction LC MS, LC DAD, GC MS |
| | | Leather | | Use is permitted and OPP is approved for use under BPR PT6 as a preservative for formulations. | |
| | | Polymers (R,F,A)* | No Limit | | |
| Multiple | Permethrin | Textile | No intentional use | 250 ppm except for processes mentioned | Solvent extraction, LC MS/MS, GC MS/MS |
| | | Leather | No intentional use | 250 ppm except for processes mentioned | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm except for processes mentioned | |
| 3380-34-5 | Triclosan | Textile | No intentional use | 250 ppm | solvent extraction LC MS, DAD |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |

In most situations, deliberate use is not permitted. However, it should be noted that Permethrin is approved for use on PT18 under BPR and is permitted for use on wool curtains and carpets, rugs and floor coverings. Permethrin is permitted for PPE use (EU 2016/425, EPA registered product, APVMA Registered Product, PMRA Registered Product, etc.). Also, its use is sometimes stipulated for certain end uses such as military. All efforts should be made to maximise the durability of the chemical finish and to minimise losses to the environment.

Chlorinated Paraffins

Potential Uses in Apparel and Footwear Textile Processing

These are used occasionally as flame retardants in certain industries. In leather formulations, these are also used as fat liquoring agents.

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|------------|--|-------------------|--------------------|-------------------|--|
| 85535-84-8 | Short-chain Chlorinated paraffin (C10- C13) | Textile | No intentional use | 50 ppm | prEN ISO 22699-2 |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |
| 85535-85-9 | Medium-chain Chlorinated paraffins (MCCPs) (C14-C17) | Textile | No intentional use | 500 ppm | prEN ISO 22699-2 |
| | | Leather | No intentional use | 500 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 500 ppm | |

Chlorobenzenes and Chlorotoluenes

Potential Uses in Apparel and Footwear Textile Processing

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.

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|----------|---|-------------------|--------------------|--|--|
| 95-50-1 | 1,2-dichlorobenzene | Textile | No intentional use | 500 ppm | GC-MS |
| | | Leather | No intentional use | 500 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 500 ppm | |
| Multiple | Other isomers of mono-, di-, tri-, tetra-, penta- and hexa-Chlorobenzene and mono-, di-, tri-, tetra- and penta-chlorotoluene | Textile | No intentional use | Sum = 200 ppm tetrachlorotoluene, and trichlorotoluene 10 ppm each | GC-MS |
| | | Leather | No intentional use | Sum = 200 ppm tetrachlorotoluene, and trichlorotoluene 10 ppm each | |
| | | Polymers (R,F,A)* | No intentional use | Sum = 200 ppm tetrachlorotoluene, and trichlorotoluene 10 ppm each | |

Chlorophenols

Potential Uses in Apparel and Footwear Textile Processing

Chlorophenols are polychlorinated compounds used as preservatives or pesticides. Pentachlorophenol (PCP) and tetrachlorophenol (TeCP) have been used in the past to prevent mould when storing/ transporting raw hides and leather. They are now regulated and should not be used.

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|----------|---------------------------------------|-------------------|--------------------|---|--|
| 87-86-5 | Pentachlorophenol (PCP) ¹ | Textile | No intentional use | Sum of substances ¹ = 20 ppm | GC-MS EN ISO 17070 |
| | | Leather | No intentional use | Sum of substances ¹ = 20 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ¹ = 20 ppm | |
| Multiple | Tetrachlorophenol (TeCP) ¹ | Textile | No intentional use | Sum of substances ¹ = 20 ppm | GC-MS EN ISO 17070 |
| | | Leather | No intentional use | Sum of substances ¹ = 20 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ¹ = 20 ppm | |
| 120-83-2 | 2,4-dichlorophenol ² | Textile | No intentional use | Sum of substances ² | GC-MS EN ISO 17070 |
| | | Leather | No intentional use | Sum of substances ² | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ² | |
| 95-57-8 | 2-chlorophenol ² | Textile | No intentional use | Sum of substances ² = 50 ppm | GC-MS EN ISO 17070 |
| | | Leather | No intentional use | Sum of substances ² = 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ² = 50 ppm | |
| 583-78-8 | 2,5-dichlorophenol ² | Textile | No intentional use | Sum of substances ² = 50 ppm | GC-MS EN ISO 17070 |
| | | Leather | No intentional use | Sum of substances ² = 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ² = 50 ppm | |
| 87-65-0 | 2,6-dichlorophenol ² | Textile | No intentional use | Sum of substances ² = 50 ppm | GC-MS EN ISO 17070 |
| | | Leather | No intentional use | Sum of substances ² = 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ² = 50 ppm | |
| 88-06-2 | 2,4,6-trichlorophenol ² | Textile | No intentional use | Sum of substances ² = 50 ppm | GC-MS EN ISO 17070 |
| | | Leather | No intentional use | Sum of substances ² = 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ² = 50 ppm | |
| 591-35-5 | 3,5-dichlorophenol ² | Textile | No intentional use | Sum of substances ² = 50 ppm | GC-MS EN ISO 17070 |
| | | Leather | No intentional use | Sum of substances ² = 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ² = 50 ppm | |

Chlorophenols

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|------------|------------------------------------|-------------------|--------------------|--|--|
| 95-95-4 | 2,4,5-trichlorophenol ² | Textile | No intentional use | Sum of substances ² = 50 ppm | GC-MS EN ISO 17070 |
| | | Leather | No intentional use | Sum of substances ² = 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ² = 50 ppm | |
| 576-24-9 | 2,3-dichlorophenol ² | Textile | No intentional use | Sum of substances ² = 50 ppm | GC-MS EN ISO 17070 |
| | | Leather | No intentional use | Sum of substances ² = 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ² = 50 ppm | |
| 95-77-2 | 3,4-dichlorophenol ² | Textile | No intentional use | Sum of substances ² = 50 ppm | GC-MS EN ISO 17070 |
| | | Leather | No intentional use | Sum of substances ² = 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ² = 50 ppm | |
| 108-43-0 | 3-chlorophenol ² | Textile | No intentional use | Sum of substances ² = 50 ppm | GC-MS EN ISO 17070 |
| | | Leather | No intentional use | Sum of substances ² = 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ² = 50 ppm | |
| 106-48-9 | 4-chlorophenol ² | Textile | No intentional use | Sum of substances ² = 50 ppm | GC-MS EN ISO 17070 |
| | | Leather | No intentional use | Sum of substances ² = 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ² = 50 ppm | |
| 15950-66-0 | 2,3,4-trichlorophenol ² | Textile | No intentional use | Sum of substances ² = 50 ppm | GC-MS EN ISO 17070 |
| | | Leather | No intentional use | Sum of substances ² = 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ² = 50 ppm | |
| 609-19-8 | 3,4,5-trichlorophenol ² | Textile | No intentional use | Sum of substances ² = 50 ppma | GC-MS EN ISO 17070 |
| | | Leather | No intentional use | Sum of substances ² = 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ² = 50 ppm | |
| 933-78-8 | 2,3,5-trichlorophenol ² | Textile | No intentional use | Sum of substances ² = 50 ppm | GC-MS EN ISO 17070 |
| | | Leather | No intentional use | Sum of substances ² = 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ² = 50 ppm | |
| 933-75-5 | 2,3,6-trichlorophenol ² | Textile | No intentional use | Sum of substances ² = 50 ppm | GC-MS EN ISO 17070 |
| | | Leather | No intentional use | Sum of substances ² = 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ² = 50 ppm | |

Dyes – Azo (Forming Restricted Amines)

Potential Uses in Apparel and Footwear Textile Processing

Azo dyes and pigments are colourants that incorporate one or several azo groups (-N=N-) bound with aromatic compounds. Thousands of azo dyes exist, but only those that degrade to form the listed cleavable amines are restricted. Azo dyes that release these amines are regulated and should no longer be used for the dyeing of textiles. Please find a non-exhaustive list of dyes which can form restricted amines in the appendix.

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|----------|--------------------------------------|-------------------|--------------------|-------------------|--|
| 101-80-4 | 4,4-oxydianiline | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 101-14-4 | 4,4-methylene-bis-(2-chloro-aniline) | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 119-90-4 | 3,3-dimethoxybenzidine | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 101-77-9 | 4,4-methylenedianiline | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 106-47-8 | 4-chloroaniline | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 119-93-7 | 3,3-dimethylbenzidine | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 120-71-8 | 6-methoxy-m-toluidine | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 139-65-1 | 4,4-thiodianiline | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 60-09-3 | 4-aminoazobenzene | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 137-17-7 | 2,4,5-trimethylaniline | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |

Dyes – Azo (Forming Restricted Amines)

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|----------|------------------------------|-------------------|--------------------|-------------------|--|
| 90-04-0 | o-anisidine | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 838-88-0 | 4,4-methylenedi-o-toluidine | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 91-94-1 | 3,3'-dichlorobenzidine | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 615-05-4 | 4-methoxy-m-phenylenediamine | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 87-62-7 | 2,6-xylylidine | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 91-59-8 | 2-naphthylamine | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 95-53-4 | o-toluidine | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 92-87-5 | Benzidine | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 95-69-2 | 4-chloro-o-toluidine | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 92-67-1 | 4-aminodiphenyl | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 95-80-7 | 4-methyl-m-phenylenediamine | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 95-68-1 | 2,4-xylylidine | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |

Dyes – Azo (Forming Restricted Amines)

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|------------|---|-------------------|--------------------|-------------------|--|
| 97-56-3 | o-aminoazotoluene | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 99-55-8 | 5-nitro-o-toluidine | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 553-00-4 | 2-Naphthylammoniumacetate | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 3165-93-3 | 4-chloro-o-toluidinium chloride | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 39156-41-7 | 4-methoxy-m-phenylene diammonium sulphate; 2,4-diaminoanisole sulphate | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |
| 21436-97-5 | 2,4,5-trimethylaniline hydrochloride | Textile | No intentional use | 150 ppm | LC, GC |
| | | Leather | No intentional use | 150 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 150 ppm | |

Dyes – Carcinogenic or Equivalent Concern

Potential Uses in Apparel and Footwear Textile Processing

Most of these substances are regulated and should no longer be used for the dyeing of textiles.

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|-----------|---|-------------------|--------------------|-------------------|--|
| 632-99-5 | C.I. Basic Violet 14 | Textile | No intentional use | 250 ppm | DIN 54231 |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 1937-37-7 | C.I. Direct Black 38 | Textile | No intentional use | 250 ppm | DIN 54231 |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 2602-46-2 | C.I. Direct Blue 6 | Textile | No intentional use | 250 ppm | DIN 54231 |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 3761-53-3 | C.I. Acid Red 26 | Textile | No intentional use | 250 ppm | DIN 54231 |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 573-58-0 | C.I. Direct Red 28 | Textile | No intentional use | 250 ppm | DIN 54231 |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 569-61-9 | C.I. Basic Red 9 | Textile | No intentional use | 250 ppm | DIN 54231 |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 2475-45-8 | C.I. Disperse Blue 1 | Textile | No intentional use | 250 ppm | DIN 54231 |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 2580-56-5 | C.I. Basic Blue 26 (with Michler's Ketone > 0.1%) | Textile | No intentional use | 250 ppm | DIN 54231 |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 2475-46-9 | C.I. Disperse Blue 3 | Textile | No intentional use | 250 ppm | DIN 54231 |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 2437-29-8 | C.I. Basic Green 4 (Malachite Green Oxalate) | Textile | No intentional use | 250 ppm | DIN 54231 |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 569-64-2 | C.I. Basic Green 4 (Malachite Green Chloride) | Textile | No intentional use | 250 ppm | DIN 54231 |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |

Dyes – Carcinogenic or Equivalent Concern

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|------------|---|-------------------|--------------------|-------------------|--|
| 82-28-0 | Disperse Orange 11 | Textile | No intentional use | 250 ppm | DIN 54231 |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 10309-95-2 | C.I. Basic Green 4 (Malachite Green) | Textile | No intentional use | 250 ppm | DIN 54231 |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 1694-09-3 | C.I. Acid Violet 49 | Textile | No intentional use | 250 ppm | DIN 54231 |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 548-62-9 | Basic violet 3 with >0.1% of Michler's Ketone | Textile | No intentional use | 250 ppm | DIN 54231 |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |

Dyes – Disperse (Sensitising)

Potential Uses in Apparel and Footwear Textile Processing

Disperse dyes are a class of water- insoluble dyes that penetrate the fibre system of synthetic or manufactured fibres and are held in place by physical forces without forming chemical bonds. Disperse dyes are used in synthetic fibre (e.g. polyester, acetate, polyamide). Restricted disperse dyes are suspected of causing allergic reactions and should no longer be used for dyeing of textiles.

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|------------|--------------------|-------------------|--------------------|-------------------|--|
| 12236-29-2 | Disperse Yellow 39 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |
| 23355-64-8 | Disperse Brown 1 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |
| 119-15-3 | Disperse Yellow 1 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |
| 12222-97-8 | Disperse Blue 102 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |

Dyes – Disperse (Sensitising)

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|------------|--------------------------|-------------------|--------------------|-------------------|--|
| 12223-01-7 | Disperse Blue 106 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |
| 13301-61-6 | Disperse Orange 37/59/76 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |
| 2581-69-3 | Disperse Orange 1 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |
| 2832-40-8 | Disperse Yellow 3 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |
| 2872-48-2 | Disperse Red 11 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |
| 2872-52-8 | Disperse Red 1 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |
| 3179-89-3 | Disperse Red 17 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |
| 54824-37-2 | Disperse Yellow 49 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |
| 3179-90-6 | Disperse Blue 7 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |
| 3860-63-7 | Disperse Blue 26 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |
| 6373-73-5 | Disperse Yellow 9 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |
| 61951-51-7 | Disperse Blue 124 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |

Dyes – Disperse (Sensitising)

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|------------|-------------------|-------------------|--------------------|-------------------|--|
| 12222-75-2 | Disperse Blue 35 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |
| 730-40-5 | Disperse Orange 3 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |
| 56524-77-7 | Disperse Blue 35 | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No Limit | | |
| | | Polymers (R,F,A)* | No Limit | | |

Dyes – Navy Blue Colourant

Potential Uses in Apparel and Footwear Textile Processing

Navy Blue Colourant is regulated and should no longer be used for the dyeing of textiles. □

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|------------------|---|-------------------|--------------------|-------------------|--|
| 118685-33-9 | Component 1: C39 H23Cl-CrN7O12S 2Na | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| Not Allocated | Component 2: C46 H-30CrN10O20S2 3Na | Textile | No intentional use | 250 ppm | LC |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |

Flame Retardants

Potential Uses in Apparel and Footwear Textile Processing

Flame retardant chemicals are rarely used to meet flammability requirements in children's clothing and adult products. They should no longer be used in apparel and footwear.

All Halogenated Flame Retardants are banned from intentional use that means including but not exclusive the list below;

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|------------|---|-------------------|--------------------|-------------------|--|
| 32536-52-0 | Octabromodiphenyl ether (OctaBDE) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 115-96-8 | Tris (2-chloroethyl) phosphate (TCEP) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 126-72-7 | Tris (2,3,-dibromopropyl) -phosphate (TRIS) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 5412-25-9 | Bis (2,3-dibromopropyl) phosphate (BIS) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 1163-19-5 | Decabromodiphenyl ether (DecaBDE) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 32534-81-9 | Pentabromodiphenyl ether (PentaBDE) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 545-55-1 | Tris (1-aziridinyl) phosphineoxide) (TEPA) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 79-94-7 | Tetrabromobisphenol A (TBBPA) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 13674-87-8 | Tris (1,3-dichloroisopropyl) phosphate (TDCP) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 59536-65-1 | Polybromobiphenyls (PBB) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |

Flame Retardants

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|---------------------------|--|----------------------|--------------------|-------------------|--|
| 3296-90-0 | 2,2-bis (bromomethyl) -1,3-propanediol (BBMP) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 3194-55-6 | Hexabromocyclododecane (HBCDD) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 10043-35-3/ 11113-50-1 | Boric acid | Textile | No intentional use | 250 ppm | GC-MS |
| Leather | | No intentional use | 250 ppm | | |
| Polymers (R,F,A)* | | No intentional use | 250 ppm | | |
| 13654-09-6 | Decabromobiphenyl (DecaBB) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 1303-96-4/ 1330-43-4 | Disodium tetraborate, anhydrous | Textile | No intentional use | 250 ppm | GC-MS |
| Leather | | No intentional use | 250 ppm | | |
| Polymers (R,F,A)* | | No intentional use | 250 ppm | | |
| 12008-41-2 | Disodium octaborate | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 21850-44-2 | dibromopropylether | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 1303-86-2 | Diboron trioxide | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 68928-80-3 | Heptabromodiphenyl ether (HeptaBDE) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| Multiple | Dibromobiphenyls (DiBB) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| Multiple | Monobromodiphenylethers (MonoBDEs) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| Multiple | Monobromobiphenyls (MonoBB) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |

Flame Retardants

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|------------|--|-------------------|--------------------|-------------------|--|
| 36483-60-0 | Hexabromodiphenyl ether (HexaBDE) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| Multiple | Nonabromobiphenyls (NonaBB) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 63936-56-1 | Nonabromodiphenyl ether (NonaBDE) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| Multiple | Octabromobiphenyls (OctaBB) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 12267-73-1 | Tetraboron disodium heptaoxide, hydrate | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 40088-47-9 | Tetrabromodiphenyl ether (TetraBDE) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| Multiple | Tribromodiphenyl ethers (TriBDEs) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |
| 13674-84-5 | Tris- (2-chloro-1-m ethylethyl) phosphate (TCPP) | Textile | No intentional use | 250 ppm | GC-MS |
| | | Leather | No intentional use | 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 250 ppm | |

Glycols / Glycol Ethers

Potential Uses in Apparel and Footwear Textile Processing

In apparel and footwear, glycols have a wide range of uses including as solvents for finishing/ cleaning, printing agents, and dissolving/ diluting fats, oils, and adhesives (e.g. in degreasing or cleaning operations).

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|------------|-----------------------------------|-------------------|--------------------|-------------------|--|
| 110-71-4 | Ethylene glycol dimethylether | Textile | No intentional use | 50 ppm | High-performance liquid chromatography (HPLC), LC-MS |
| | | Leather | No intentional use | 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 50 ppm | |
| 110-49-6 | 2-methoxyethylacetate | Textile | No intentional use | 50 ppm | High-performance liquid chromatography (HPLC), LC-MS |
| | | Leather | No intentional use | 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 50 ppm | |
| 110-80-5 | 2-ethoxyethanol | Textile | No intentional use | 50 ppm | High-performance liquid chromatography (HPLC), LC-MS |
| | | Leather | No intentional use | 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 50 ppm | |
| 109-86-4 | 2-methoxyethanol | Textile | No intentional use | 50 ppm | High-performance liquid chromatography (HPLC), LC-MS |
| | | Leather | No intentional use | 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 50 ppm | |
| 111-96-6 | Bis (2-methoxyethyl)-ether | Textile | No intentional use | 50 ppm | High-performance liquid chromatography (HPLC), LC-MS |
| | | Leather | No intentional use | 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 50 ppm | |
| 111-15-9 | 2-ethoxyethyl acetate | Textile | No intentional use | 50 ppm | High-performance liquid chromatography (HPLC), LC-MS |
| | | Leather | No intentional use | 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 50 ppm | |
| 70657-70-4 | 2-methoxypropylacetate | Textile | No intentional use | 50 ppm | High-performance liquid chromatography (HPLC), LC-MS |
| | | Leather | No intentional use | 1000 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |
| 112-49-2 | Triethylene glycol dimethyl ether | Textile | No intentional use | 50 ppm | High-performance liquid chromatography (HPLC), LC-MS |
| | | Leather | No intentional use | 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 50 ppm | |

Halogenated Solvents

Potential Uses in Apparel and Footwear Textile Processing

In apparel and footwear, halogenated solvents are used as finishing/ cleaning and printing agents, for dissolving/ diluting fats, oils and adhesives (e.g. in degreasing or cleaning operations).

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|----------|---------------------|-------------------|--------------------|------------------------------|--|
| 75-09-2 | Methylene chloride | Textile | No intentional use | 5 ppm | GC-MS |
| | | Leather | No intentional use | 5 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 5 ppm | |
| 79-01-6 | Trichloroethylene | Textile | No intentional use | 40 ppm | GC-MS |
| | | Leather | No intentional use | 40 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 40 ppm | |
| 127-18-4 | Tetrachloroethylene | Textile | No intentional use | 5 ppm | GC-MS |
| | | Leather | No intentional use | 5 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 5 ppm | |
| 100-44-7 | Benzylchloride | Textile | No intentional use | 50 ppm, and 100 ppm for dyes | GC-MS with confirmatory LC-MS in the event of a positive detection |
| | | Leather | No intentional use | 50 ppm, and 100 ppm for dyes | |
| | | Polymers (R,F,A)* | No intentional use | 50 ppm, and 100 ppm for dyes | |
| 107-06-2 | 1,2-dichloroethane | Textile | No intentional use | 5 ppm | GC- MS |
| | | Leather | No intentional use | 5 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 5 ppm | |

Organotin Compounds

Potential Uses in Apparel and Footwear Textile Processing

Organotins are a class of chemicals combining tin and organics such as butyl and phenyl groups. Organotins are predominantly found in the environment as antifoulants in marine paints, but they can also be used as biocides (e.g. antibacterials), catalysts in plastic and glue production and heat stabilisers in plastics/rubber. In textiles and apparel, organotins are associated with plastics/rubber, inks, paints, metallic glitter, polyurethane products and heat transfer material.

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|----------|---|-------------------|--------------------|---|--|
| Multiple | Dibutyltin (DBT) | Textile | No intentional use | 20 ppm | Solvent extraction, GC MS, ISO TS 16179 |
| | | Leather | No intentional use | 20 ppm (EXCEPTION 100 ppm for polyurethane based thickeners used at | |
| | | Polymers (R,F,A)* | No intentional use | 20 ppm | |
| Multiple | Mono-, di- and trimethyltin derivatives | Textile | No intentional use | 5 ppm | Solvent extraction, GC MS, ISO TS 16179 |
| | | Leather | No intentional use | 5 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 5 ppm | |
| Multiple | Mono-, di- and trioctyltin derivatives | Textile | No intentional use | 5 ppm | Solvent extraction, GC MS, ISO TS 16179 |
| | | Leather | No intentional use | 5 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 5 ppm | |
| Multiple | Mono-, di- and triphenyltin derivatives | Textile | No intentional use | 5 ppm | Solvent extraction, GC MS, ISO TS 16179 |
| | | Leather | No intentional use | 5 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 5 ppm | |
| Multiple | Mono- and tributyltin derivatives | Textile | No intentional use | 5 ppm | Solvent extraction, GC MS, ISO TS 16179 |
| | | Leather | No intentional use | 5 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 5 ppm | |
| Multiple | Dipropyltin compounds (DPT) | Textile | No intentional use | 5 ppm | Solvent extraction, GC MS, ISO TS 16179 |
| | | Leather | No intentional use | 5 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 5 ppm | |
| Multiple | Tetraethyltin Compounds (TeET) | Textile | No intentional use | 1 ppm | Solvent extraction, GC MS, ISO TS 16179 |
| | | Leather | No intentional use | 1 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 1 ppm | |
| Multiple | Tripropyltin Compounds (TPT) | Textile | No intentional use | 1 ppm | Solvent extraction, GC MS, ISO TS 16179 |
| | | Leather | No intentional use | 1 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 1 ppm | |
| Multiple | Tetrabutyltin compounds (TeBT) | Textile | No intentional use | 1 ppm | Solvent extraction, GC MS, ISO TS 16179 |
| | | Leather | No intentional use | 1 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 1 ppm | |
| Multiple | Tetraoctyltin compounds (TeOT) | Textile | No intentional use | 1 ppm | Solvent extraction, GC MS, ISO TS 16179 |
| | | Leather | No intentional use | 1 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 1 ppm | |

Organotin Compounds

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|----------|--------------------------|-------------------|--------------------|-------------------|--|
| Multiple | Tricyclohexyltin (TCyHT) | Textile | No intentional use | 1 ppm | Solvent extraction, GC MS, ISO TS 16179 |
| | | Leather | No intentional use | 1 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 1 ppm | |

Other/ Miscellaneous Chemicals

These are other chemicals/ substances/ process with a usage ban.

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|------------|-------------------|-------------------|--------------------|-------------------|--|
| 12767-90-7 | Borate, zinc salt | Textile | No intentional use | 1000 ppm | Acid digestion, ICP |
| | | Leather | No intentional use | 1000 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 1000 ppm | |

Borate, zinc salt can be used as a flame retardant but also in paints, pigments, and adhesives.

| | | | | | |
|---------|-------------|-------------------|--------------------|---------|-------------------------------------|
| 80-05-7 | Bisphenol A | Textile | No intentional use | 100 ppm | Solvent extraction, LC MS/MS, GC MS |
| | | Leather | No intentional use | 100 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |

Bisphenol A (BPA) is a precursor chemical used along with other chemicals to create some plastics and resins. It is commonly used to harden plastics.

| | | | | | |
|---------|----------|-------------------|--------------------|----------|------------------------------|
| 62-56-6 | Thiourea | Textile | No intentional use | 1000 ppm | Solvent extraction, LC MS/MS |
| | | Leather | No intentional use | 1000 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 1000 ppm | |

Thiourea is used in many formulations to increase the solubility.

| | | | | | |
|---------|-----------|-------------------|--------------------|----------|-----------|
| 91-22-5 | Quinoline | Textile | No intentional use | 1000 ppm | DIN 54231 |
| | | Leather | No intentional use | 1000 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 1000 ppm | |

Contaminant of dispersing agents in disperse dyes.

| | | | | | |
|------------|---------------------------------------|-------------------|--------------------|-------------------------|---|
| 14464-46-1 | Silica (particles of respirable size) | Textile | No intentional use | No use of Sand Blasting | Process due diligence, no test method available |
| | | Leather | No intentional use | No use of Sand Blasting | |
| | | Polymers (R,F,A)* | No intentional use | No use of Sand Blasting | |

Respirable particles of silica are often generate during the process of sand blasting.

Other/ Miscellaneous Chemicals

These are other chemicals/ substances/ process with a usage ban.

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|----------|--|-------------------|--------------------|-------------------|--|
| 111-41-1 | AEEA [2- (2-amino ethylamino) ethanol] | Textile | No intentional use | 100 ppm | Solvent extraction, LC MS/MS |
| | | Leather | No intentional use | 100 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 100 ppm | |

AEEA is used a.o. in chelating agents, surfactants and fabric softeners.

Perfluorinated and Polyfluorinated Chemicals (PFCs)

Durable water, oil and stain repellent finishes based on long-chain PFC's are banned from intentional use. There are two methods of manufacture of PFCs referred to as electrofluorination and telomerisation. PFC's made by the electrofluorination method have by-products associated with them called perfluoroalkyl sulphonates with the most common being the C8 species Perfluorooctane sulphonate (PFOS). The deliberate use of any PFCs made by electrofluorination with a chain length of C6 or above is not permitted. The detection of any PFOS analogue as where the chain length is 6 units or longer will trigger a failure [i.e. PFHS and above]. These types of PFCs are typically used in home textiles. PFC's made by the telomerisation method have by-products associated with them called perfluorocarboxylic acids with the most common being the C8 species perfluorooctanoic acid (PFOA). The deliberate use of any PFCs made by telomerisation with a chain length of C8 or above is restricted. ZDHC plans to further restrict the use of PFCs in future revisions and details can be found in the candidate list is not permitted. The detection of any PFOA analogue as where the chain length is 8 units or longer will trigger a failure (i.e. PFOA and above). These types of PFCs are typically used in clothing and footwear.

Potential Uses in Apparel and Footwear Textile Processing

PFOA and PFOS may be present as unintended by-products in long-chain commercial water, oil and stain repellent agents. PFOA also may be in used in the production for polymers like polytetrafluoroethylene (PTFE).

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|----------|---|-------------------|--------------------|--|--|
| Multiple | Perfluorooctane sulfonate (PFOS) and related substances | Textile | No intentional use | Sum = 2 ppm | LC-MS |
| | | Leather | No intentional use | Sum = 2 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum = 2 ppm | |
| Multiple | Perfluorooctanoic acid (PFOA) and related substances | Textile | No intentional use | PFOA = 25 ppb PFOA-related substances = 1000 ppb | LC-MS |
| | | Leather | No intentional use | PFOA = 25 ppb PFOA-related substances = 1000 ppb | |
| | | Polymers (R,F,A)* | No intentional use | PFOA = 25 ppb PFOA-related substances = 1000 ppb | |

Phthalates – including all other esters of ortho-phthalic acid

Potential Uses in Apparel and Footwear Textile Processing

Esters of ortho-phthalic acid (phthalates) are a class of organic compounds commonly added to plastics to increase flexibility. They sometimes are used to facilitate 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 sleeveings
- Polymeric coatings

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|------------|--|-------------------|--------------------|--|--|
| 117-84-0 | Di-n-octyl phthalate (DNOP) ⁵ | Textile | No intentional use | Sum of substances ⁵ = 250 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁵ = 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ⁵ = 250 ppm | |
| 117-82-8 | Bis (2-methoxyethyl) phthalate (DMEP) ⁵ | Textile | No intentional use | Sum of substances ⁵ = 250 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁵ = 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ⁵ = 250 ppm | |
| 26761-40-0 | Di-iso-decyl phthalate (DIDP) ⁵ | Textile | No intentional use | Sum of substances ⁵ = 250 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁵ = 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ⁵ = 250 ppm | |
| 117-81-7 | Di (ethylhexyl) phthalate (DEHP) ⁵ | Textile | No intentional use | Sum of substances ⁵ = 250 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁵ = 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ⁵ = 250 ppm | |
| 28553-12-0 | Di-isononyl phthalate (DINP) ⁵ | Textile | No intentional use | Sum of substances ⁵ = 250 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁵ = 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ⁵ = 250 ppm | |
| 84-75-3 | Di-n-hexyl phthalate (DnHP) ⁵ | Textile | No intentional use | Sum of substances ⁵ = 250 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁵ = 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ⁵ = 250 ppm | |
| 85-68-7 | Butyl benzyl phthalate (BBP) ⁵ | Textile | No intentional use | Sum of substances ⁵ = 250 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁵ = 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ⁵ = 250 ppm | |

Phthalates – including all other esters of ortho-phthalic acid

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|---------------------------|---|-------------------|--------------------|--|--|
| 84-74-2 | Dibutyl phthalate (DBP) ⁵ | Textile | No intentional use | Sum of substances ⁵ = 250 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁵ = 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ⁵ = 250 ppm | |
| 84-76-4 | Dinonyl phthalate (DNP) ⁵ | Textile | No intentional use | Sum of substances ⁵ = 250 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁵ = 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ⁵ = 250 ppm | |
| 84-66-2 | Diethyl phthalate (DEP) ⁵ | Textile | No intentional use | Sum of substances ⁵ = 250 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁵ = 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ⁵ = 250 ppm | |
| 131-16-8 | Di-n-propyl phthalate (DPRP) ⁵ | Textile | No intentional use | Sum of substances ⁵ = 250 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁵ = 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ⁵ = 250 ppm | |
| 84-61-7 | Di-cyclohexyl phthalate (DCHP) ⁵ | Textile | No intentional use | Sum of substances ⁵ = 250 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁵ = 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ⁵ = 250 ppm | |
| 84-69-5 | Di-isobutyl phthalate (DIBP) ⁵ | Textile | No intentional use | Sum of substances ⁵ = 250 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁵ = 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ⁵ = 250 ppm | |
| 27554-26-3 | Di-iso-octyl phthalate (DIOP) ⁵ | Textile | No intentional use | Sum of substances ⁵ = 250 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁵ = 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ⁵ = 250 ppm | |
| 68515-42-4/ 68515-50-4 | 1,2-benzenedicarboxylic acid, di-C7-11 branched and linear alkyl esters (DHNUP) ⁵ | Textile | No intentional use | Sum of substances ⁵ = 250 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁵ = 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ⁵ = 250 ppm | |
| 71888-89-6/ 84777-06-0 | 1,2-benzenedicarboxylic acid, di-C6-8 branched and linear alkyl esters, C7-rich (DIHP) ⁵ | Textile | No intentional use | Sum of substances ⁵ = 250 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁵ = 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ⁵ = 250 ppm | |

Phthalates – including all other esters of ortho-phthalic acid

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|----------|------------------------------------|-------------------|--------------------|--|--|
| 605-50-5 | Diisopentylphthalates ⁵ | Textile | No intentional use | Sum of substances ⁵ = 250 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁵ = 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ⁵ = 250 ppm | |
| 131-18-0 | Di-n-pentylphthalates ⁵ | Textile | No intentional use | Sum of substances ⁵ = 250 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁵ = 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Sum of substances ⁵ = 250 ppm | |

Polycyclic Aromatic Hydrocarbons (PAHs)

Potential Uses in Apparel and Footwear Textile Processing

Oil containing PAHs are added to rubber and plastics as a softener or extender and may be found in rubber, plastics, lacquers, and coatings. Within the footwear producing industry, PAHs are often found in the outsoles of footwear and in printing pastes for screen prints. PAHs can be present as impurities in carbon black dyestuffs.

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|----------|-------------------------------------|-------------------|--------------------|--|--|
| 50-32-8 | Benzo[a]pyrene | Textile | No intentional use | 20 ppm | GC-MS |
| | | Leather | No intentional use | 20 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 20 ppm | |
| 129-00-0 | Pyrene ^{3,4} | Textile | No intentional use | Sum of substances ³ = 200 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁴ = 200 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |
| 191-24-2 | Benzo[ghi]perylene ^{3,4} | Textile | No intentional use | Sum of substances ³ = 200 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁴ = 200 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |
| 205-82-3 | Benzo[j]fluoranthene ^{3,4} | Textile | No intentional use | Sum of substances ³ = 200 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁴ = 200 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |
| 120-12-7 | Anthracene ^{3,4} | Textile | No intentional use | Sum of substances ³ = 200 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁴ = 200 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |

Polycyclic Aromatic Hydrocarbons (PAHs)

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|----------|---------------------------------------|-------------------|--------------------|--|--|
| 193-39-5 | Indeno[1,2,3-cd]pyrene ^{3,4} | Textile | No intentional use | Sum of substances ³ = 200 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁴ = 200 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |
| 192-97-2 | Benzo[e]pyrene ^{3,4} | Textile | No intentional use | Sum of substances ³ = 200 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁴ = 200 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |
| 205-99-2 | Benzo[b]fluoranthene ^{3,4} | Textile | No intentional use | Sum of substances ³ = 200 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁴ = 200 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |
| 207-08-9 | Benzo[k]fluoranthene ^{3,4} | Textile | No intentional use | Sum of substances ³ = 200 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁴ = 200 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |
| 206-44-0 | Fluoranthene ^{3,4} | Textile | No intentional use | Sum of substances ³ = 200 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁴ = 200 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |
| 208-96-8 | Acenaphthylene ^{3,4} | Textile | No intentional use | Sum of substances ³ = 200 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁴ = 200 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |
| 53-70-3 | Dibenz[a,h]anthracene ^{3,4} | Textile | No intentional use | Sum of substances ³ = 200 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁴ = 200 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |
| 218-01-9 | Chrysene ^{3,4} | Textile | No intentional use | Sum of substances ³ = 200 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁴ = 200 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |
| 85-01-8 | Phenanthrene ^{3,4} | Textile | No intentional use | Sum of substances ³ = 200 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁴ = 200 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |

Polycyclic Aromatic Hydrocarbons (PAHs)

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|---------|-----------------------------------|-------------------|--------------------|--|--|
| 83-32-9 | Acenaphthene ^{3,4} | Textile | No intentional use | Sum of substances ³ = 200 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁴ = 200 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |
| 86-73-7 | Fluorene ^{3,4} | Textile | No intentional use | Sum of substances ³ = 200 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁴ = 200 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |
| 91-20-3 | Naphthalene ³ | Textile | No intentional use | Sum of substances ³ = 200 ppm | GC-MS |
| | | Leather | No intentional use | 300 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |
| 56-55-3 | Benzo[a]anthracene ^{3,4} | Textile | No intentional use | Sum of substances ³ = 200 ppm | GC-MS |
| | | Leather | No intentional use | Sum of substances ⁴ = 200 ppm | |
| | | Polymers (R,F,A)* | No Limit | | |

Total Heavy Metals

In the list below the formulation limit for As, Cd, Hg, Pb and Cr VI apply to all types of formulation. Where there is a specific limit for pigments that that is different to the general limit this is shown in brackets.

The formulation limits for Sb, Cr, Ba, Se, Sn, Ni, Cu, Co and Ag only apply to dye and/or pigment formulations. Any differences between limits for dyes and pigments are indicated in the formulation limit column.

The limits for the heavy metals do not apply to colourants containing a listed metal as an inherent compositional part (e.g. metal-complex colorants, the double salts of certain cationic colourants or extenders like barium sulfate). When using any colourant with listed metals as an inherent compositional part, wet processors need to be aware of the need to comply with brand RSL limits with respect to extractable metals from dyed materials and they also need to be aware of the metal limits in the ZDHC wastewater guidelines. Where RSL and/or wastewater issues are observed wet processors should discuss this with supply chain partners.

For the listed exceptions, laboratory tests to determine separately metal contaminants that are not bound into a colourant (free metals) are under development.

Potential Uses in Apparel and Footwear Textile Processing

Although typically associated with leather tanning, chromium VI also may be used in the dyeing of wool (after the chroming process). □

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|------------|---------------|-------------------|--------------------|------------------------------|--|
| 7440-38-2 | Arsenic (As) | Textile | No intentional use | 50 ppm | Inductively coupled plasma-optical emission spectrometry (ICP-OES), atomic absorption spectroscopy (AAS) |
| | | Leather | No intentional use | 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 50 ppm | |
| 7440-43-9 | Cadmium (Cd) | Textile | No intentional use | 20 ppm (50 ppm for pigments) | Inductively coupled plasma-optical emission spectrometry (ICP-OES), atomic absorption spectroscopy (AAS) |
| | | Leather | No intentional use | 20 ppm (50 ppm for pigments) | |
| | | Polymers (R,F,A)* | No intentional use | 20 ppm (50 ppm for pigments) | |
| 7439-97-6 | Mercury (Hg) | Textile | No intentional use | 4 ppm (25 ppm for pigments) | Inductively coupled plasma-optical emission spectrometry (ICP-OES), atomic absorption spectroscopy (AAS) |
| | | Leather | No intentional use | 4 ppm (25 ppm for pigments) | |
| | | Polymers (R,F,A)* | No intentional use | 4 ppm (25 ppm for pigments) | |
| 7439-92-1 | Lead (Pb) | Textile | No intentional use | 100 ppm | Inductively coupled plasma-optical emission spectrometry (ICP-OES), atomic absorption spectroscopy (AAS) |
| | | Leather | No intentional use | 100 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 100 ppm | |
| 18540-29-9 | Chromium (VI) | Textile | No intentional use | 10 ppm | Inductively coupled plasma-optical emission spectrometry (ICP-OES), atomic absorption spectroscopy (AAS) |
| | | Leather | No intentional use | 10 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 10 ppm | |
| 7440-36-0 | Antimony | Textile | No intentional use | Dye 50/ Pigment 250 ppm | Acid digestion, ICP |
| | | Leather | No intentional use | Dye 50/ Pigment 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Dye 50/ Pigment 250 ppm | |

Total Heavy Metals

In the list below the formulation limit for As, Cd, Hg, Pb and Cr VI apply to all types of formulation. Where there is a specific limit for pigments that that is different to the general limit this is shown in brackets.

The formulation limits for Sb, Cr, Ba, Se, Sn, Ni, Cu, Co and Ag only apply to dye and/or pigment formulations. Any differences between limits for dyes and pigments are indicated in the formulation limit column.

The limits for the heavy metals do not apply to colourants containing a listed metal as an inherent compositional part (e.g. metal-complex colorants, the double salts of certain cationic colourants or extenders like barium sulfate). When using any colourant with listed metals as an inherent compositional part, wet processors need to be aware of the need to comply with brand RSL limits with respect to extractable metals from dyed materials and they also need to be aware of the metal limits in the ZDHC wastewater guidelines. Where RSL and/or wastewater issues are observed wet processors should discuss this with supply chain partners.

For the listed exceptions, laboratory tests to determine separately metal contaminants that are not bound into a colourant (free metals) are under development.

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|-----------|-----------|-------------------|--------------------|---------------------------|--|
| 7440-47-3 | Chromium | Textile | No intentional use | Dyes and Pigments 100 ppm | Acid digestion, ICP |
| | | Leather | No intentional use | Dyes and Pigments 100 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Dyes and Pigments 100 ppm | |
| 7440-39-3 | Barium | Textile | No intentional use | Dyes and Pigments 100 ppm | Acid digestion, ICP |
| | | Leather | No intentional use | Dyes and Pigments 100 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Dyes and Pigments 100 ppm | |
| 7782-49-2 | Selenium | Textile | No intentional use | Dyes 20/ pigments 100 ppm | Acid digestion, ICP |
| | | Leather | No intentional use | Dyes 20/ pigments 100 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Dyes 20/ pigments 100 ppm | |
| 7440-31-5 | Tin | Textile | No intentional use | Dyes 250 ppm | Acid digestion, ICP |
| | | Leather | No intentional use | Dyes 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Dyes 250 ppm | |
| 7440-02-0 | Nickel | Textile | No intentional use | Dyes 250 ppm | Acid digestion, ICP |
| | | Leather | No intentional use | Dyes 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Dyes 250 ppm | |
| 7440-50-8 | Copper | Textile | No intentional use | Dyes 250 ppm | Acid digestion, ICP |
| | | Leather | No intentional use | Dyes 250 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Dyes 250 ppm | |
| 7440-48-4 | Cobalt | Textile | No intentional use | Dyes 500 ppm | Acid digestion, ICP |
| | | Leather | No intentional use | Dyes 500 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Dyes 500 ppm | |
| 7440-22-4 | Silver | Textile | No intentional use | Dyes 100 ppm | Acid digestion, ICP |
| | | Leather | No intentional use | Dyes 100 ppm | |
| | | Polymers (R,F,A)* | No intentional use | Dyes 100 ppm | |

UV absorbers

Potential Uses in Apparel and Footwear Textile Processing

These are frequently used in formulations to be stable to the influences of light and UV ☐

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|------------|--|-------------------|--------------------|-------------------|--|
| 36437-37-3 | 2- (2H-benzotriazol-2-yl) -4- (tert-butyl) -6- (sec-butyl) phenol (UV-350) | Textile | No intentional use | 1000 ppm | Solvent extraction, LC MS/MS, GC MS |
| | | Leather | No intentional use | 1000 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 1000 ppm | |
| 3846-71-7 | 2-benzotriazol-2-yl -4,6-di-tert-butylphenol (UV-320) | Textile | No intentional use | 1000 ppm | Solvent extraction, LC MS/MS, GC MS |
| | | Leather | No intentional use | 1000 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 1000 ppm | |
| 3864-99-1 | 2,4-Di-tert-butyl-6-(5-chlorobenzotriazole-2-yl) phenol (UV-327) | Textile | No intentional use | 1000 ppm | Solvent extraction, LC MS/MS, GC MS |
| | | Leather | No intentional use | 1000 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 1000 ppm | |
| 25973-55-1 | 2- (2H-benzotriazol-2-yl) -4,6-ditertpentylphenol (UV-328) | Textile | No intentional use | 1000 ppm | Solvent extraction, LC MS/MS, GC MS |
| | | Leather | No intentional use | 1000 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 1000 ppm | |

Volatile Organic Compounds (VOC)

Potential Uses in Apparel and Footwear Textile Processing

These Volatile Organic Compounds (VOC) should not be used in textile auxiliary chemical preparations. They are associated with solvent-based processes like solvent-based polyurethane coatings and glues/ adhesives. They should not be used for any kind of facility cleaning or spot cleaning.

| CASNO | Substance | Applicability | Supplier Guidance | Formulation Limit | General Techniques for Analysing Chemicals |
|-----------|-----------|-------------------|--------------------|-------------------|--|
| 71-43-2 | Benzene | Textile | No intentional use | 50 ppm | GC-MS |
| | | Leather | No intentional use | 50 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 50 ppm | |
| 95-48-7 | o-cresol | Textile | No intentional use | 500 ppm | GC-MS |
| | | Leather | No intentional use | 500 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 500 ppm | |
| 106-44-5 | p-cresol | Textile | No intentional use | 500 ppm | GC-MS |
| | | Leather | No intentional use | 500 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 500 ppm | |
| 1330-20-7 | Xylene | Textile | No intentional use | 500 ppm | GC-MS |
| | | Leather | No intentional use | 500 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 500 ppm | |
| 108-39-4 | m-cresol | Textile | No intentional use | 500 ppm | GC-MS |
| | | Leather | No intentional use | 500 ppm | |
| | | Polymers (R,F,A)* | No intentional use | 500 ppm | |

(Free) Aniline

Potential Uses in Apparel and Footwear Textile Processing

Used for indigo and to manufacture AZO Dyes (especially the leather dyes).

| CASNO | Substance | Intent |
|---------|----------------|---|
| 62-53-3 | (Free) Aniline | High levels of free aniline can be encountered in some indigo dye formulations. In Version 3 of the ZDHC MRSL it is intended to place restrictions on the maximum permitted levels of free aniline in indigo dye formulations (it is intended that the limit for Indigo will be 2000 ppm and for other dyes 500 ppm). Studies on levels of free aniline in currently available liquid and powder formulations and determination of safe levels of aniline for workers are required to determine appropriate levels. |

ADCA

Potential Uses in Apparel and Footwear Textile Processing

ADCA is used as a foaming/ blowing agent for rubber applications.

| CASNO | Substance | Intent |
|----------|--|---|
| 123-77-3 | Diazeno-1,2-dicarb oxamide [C,C`-azodi (formamide) , ADCA] | It is intended to restrict ADCA in Version 3 of the ZDHC MRSL. Additionally, a wider appraisal of foaming/blowing agents and vulcanisation accelerators will be conducted and further chemicals may be included at that time. |

Cyclic Siloxanes

| CASNO | Substance | Intent |
|----------|-----------|---|
| 541-02-6 | D5 | These silicones are known contaminants in silicone formulation, the industry is currently reviewing the impact on silicone polymers. ZDHC will assess restrictions for the next update the intention is to restrict at 1000 ppm |
| 540-97-6 | D6 | These silicones are known contaminants in silicone formulation, the industry is currently reviewing the impact on silicone polymers. ZDHC will assess restrictions for the next update the intention is to restrict at 1000 ppm |
| 556-67-2 | D4 | These silicones are known contaminants in silicone formulation, the industry is currently reviewing the impact on silicone polymers. ZDHC will assess restrictions for the next update the intention is to restrict at 1000 ppm |

Dimethylfumarate

| CASNO | Substance | Intent |
|----------|-------------------------|--|
| 624-49-7 | Dimethylfumarate (DMFu) | DMFu must not be deliberately used in any formulations. It is intended to publish details of a universally agreed, robust test method and maximum allowable limit in version 3 of the MRSL. It should be noted that DMFu remains illegal in articles placed on the EU market above 0.1 ppm so testing for DMFu in formulations using methods currently recommended by laboratories is strongly advised, with any detections resulting in an investigation into deliberate use at all stages in the supply chain. |

Dyes – Carcinogenic or Equivalent Concern

Potential Uses in Apparel and Footwear Textile Processing

Green dye

| CASNO | Substance | Intent |
|----------|-------------------------------|---|
| 129-73-7 | C.I. Basic Green 4 leuco base | C.I Basic Green 4 leuco base will be restricted with the intended limit of 250 PPM in the next ZDHC MRSL update. Application using techniques such as gel-dyeing are unlikely to be restricted. |

Flame Retardants

Potential Uses in Apparel and Footwear Textile Processing

Flame retardant chemicals are rarely used to meet flammability requirements in children’s clothing and adult products.

| CASNO | Substance | Intent |
|------------|--------------------------|--|
| 25155-23-1 | Trixylyl phosphate (TXP) | Certain phosphate flame retardants will be assessed for restrictions for the next ZDHC MRSL Update. Intended Limit is 50 PPM |
| 78-30-8 | Tri-o-cresyl phosphate | Certain phosphate flame retardants will be assessed for restrictions for the next ZDHC MRSL Update. Intended Limit is 50 PPM |
| 512-56-1 | Trimethyl phosphate | Certain phosphate flame retardants will be assessed for restrictions for the next ZDHC MRSL Update. Intended limit is under discussion |

Formaldehyde

Potential Uses in Apparel and Footwear Textile Processing

Formaldehyde has many uses in printing, interlinings, stiffeners, etc.

| CASNO | Substance | Intent |
|---------|--------------|---|
| 50-00-0 | Formaldehyde | The deliberate use of formaldehyde or inclusion of formaldehyde in formulations is not permitted. In Version 3 of the ZDHC MRSL it is intended to place restrictions on the maximum permitted levels of formaldehyde in formulations. The use, presence and generation of formaldehyde is a complex subject and studies are required to determine appropriate levels. |

Perfluorinated and Polyfluorinated Chemicals (PFCs)

Potential Uses in Apparel and Footwear Textile Processing

Used as water repellent, stain repellent and in certain cases to improve the colour fastness properties.

| CASNO | Substance | Intent |
|------------------------|--|---|
| 355-46-4 / 432-50-7 | Perfluorohexane sulfonic acid / Perfluorohexane sulfonate (PFHxS) | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| Several | Perfluoroalkylsulfonates F (CF ₂) _n SO ₃ | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| 1763-23-1 | Perfluorooctane sulfonic acid / Perfluorooctane sulfonate (PFOS) | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| Several | PFSA Chemicals | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations |

after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □

Perfluorinated and Polyfluorinated Chemicals (PFCs)

| CASNO | Substance | Intent |
|------------------------|---|---|
| Several | Perfluoroalkylsulfonamidoethanols F (CF ₂) nSO ₂ N (R) CH ₂ CH ₂ OH ₂ -CH ₃ , -CH ₂ CH ₃] | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| Several | Perfluoroalkylsulfonamides F (CF ₂) nSO ₂ NH ₂ | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| Several | Perfluoroalkylsulfonamidoethyl (meth) acrylates F (CF ₂) nSO ₂ N (R) CH ₂ CH ₂ OC (O) CH (R) =CH ₂ -CH ₃ , -CH ₂ CH ₃] | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| Several | PFBS Chemicals | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| 375-73-5 29420-43-3 | Perfluorobutane sulfonic acid / Perfluorobutanesulfonates (PFBS) F (CF ₂) 4SO ₃ | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| Several | Perfluorobutanesulfonamidoethyl (meth) acrylates F (CF ₂) 4SO ₂ N (R) CH ₂ CH ₂ OC (O) CH (R) =CH ₂ [R = H, -CH ₃ , -CH ₂ CH ₃] | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |

Perfluorinated and Polyfluorinated Chemicals (PFCs)

| CASNO | Substance | Intent |
|------------|--|---|
| Several | Perfluorobutanesulfonamidoethanols F (CF ₂) ₄ SO ₂ N (R)CH ₂ CH ₂ OH [R = H, -CH ₃ , -CH ₂ CH ₃] | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| Several | Perfluorobutanesulfonamide F (CF ₂) ₄ SO ₂ NH ₂ | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| Several | Fluorotelomer alcohols (FTOHs) F (CF ₂) _n CH ₂ CH ₂ OH | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| Several | Fluorotelomer Olefins (FTOs) | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| 647-42-7 | 6:2 FTOH, Perfluorohexylethanol | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| 25291-17-2 | Perfluorohexylethene | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |

Perfluorinated and Polyfluorinated Chemicals (PFCs)

| CASNO | Substance | Intent |
|---------------------|---|---|
| Several | Fluorotelomer (Meth) Acrylates | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| Several | Perfluorohexylethyl acrylate or methacrylate Perfluorocarboxylic acid and salts (PFCA) | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| 3825-26-1 | Ammonium penta-decafluorooctanoate (APFO) | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| 2058-94-8 | Henicosafuoroundecanoic acid | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| 335-76-2 or Several | Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| 307-55-1 | Tricosafuorododecanoic acid | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |

Perfluorinated and Polyfluorinated Chemicals (PFCs)

| CASNO | Substance | Intent |
|------------|--------------------------------------|---|
| 72629-94-8 | Pentacosafluorotri decanoic acid | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| 375-22-4 | Perfluorobutanoic acid (PFBA) | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| 335-67-1 | Perfluorooctanoic acid (PFOA) | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| 375-85-9 | Perfluoroheptanoi c acid (PFHpA) | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| 376-06-7 | Heptacosafuorote tridecanoic acid | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| 307-24-4 | Perfluorohexanoic acid (PFHxA) | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |

Perfluorinated and Polyfluorinated Chemicals (PFCs)

| CASNO | Substance | Intent |
|------------|---------------------------------|---|
| 375-95-1 | Perfluorononanoic acid (PFNA) | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| 678-39-7 | 8:2 FTOH, Perfluorooctylethanol | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| 507-63-1 | Heptadecafluoro-1-iodooctane | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| Several | PFOA-related substances | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| 2043-53-0 | 1H,1H,2H,2H-Perfluorodecylidide | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |
| 21652-58-4 | Perfluorooctylethene | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |

Perfluorinated and Polyfluorinated Chemicals (PFCs)

| CASNO | Substance | Intent |
|---------|--|---|
| Several | Perfluorooctylethyl acrylate or methacrylate** | C8 and some C6 PFCs are currently restricted in Version 2.0 of the ZDHC MRSL. In Version 3 of the ZDHC MRSL it is intended to ban the deliberate use of all functional finishes based on PFC's except for anticipated derogations under EU law, such as protective articles where the highest levels of repellency are required to safeguard the user. In signalling this forthcoming restriction it is expected that wet processors plan to take no new deliveries of PFC-containing formulations after the publication of ZDHC MRSL Version 3. The following list includes PFC's that are already restricted in version 2 and those intended to be restricted in version 3. □ |

Phenol

Potential Uses in Apparel and Footwear Textile Processing

Phenol is not deliberately used in textiles or footwear but trace amounts of phenol can be found in many chemical formulations.

| CASNO | Substance | Intent |
|----------|-----------|---|
| 108-95-2 | Phenol | ZDHC is looking for safe limits for phenol as a contaminant in textile chemical formulations. |

Solvents

Potential Uses in Apparel and Footwear Textile Processing

There are many uses for solvents from adhesives, coated textiles, prints, etc.

| CASNO | Substance | Intent |
|-----------|-----------------------------|---|
| 1589-47-5 | 2-methoxypropanol | In Version 3 of the ZDHC MRSL it is intended to place restrictions on certain solvents with certain specific hazardous properties (e.g. CMR's). The restrictions are likely to apply to the inclusion of such solvents in formulations for use by wet processors and product assembly factories - and deliberate use of neat solvents in those facilities. Studies on usage patterns, exposure controls, safer alternatives and the potential effects of restrictions are necessary before restrictions can be proposed. Any potential ZDHC MRSL limits will need to be established collaboratively with groups who are working in parallel to study solvents in relation to workplace safety, air emissions, RSL compliance and downstream concerns. |
| 108-88-3 | Toluene | In Version 3 of the ZDHC MRSL it is intended to place restrictions on certain solvents with certain specific hazardous properties (e.g. CMR's). The restrictions are likely to apply to the inclusion of such solvents in formulations for use by wet processors and product assembly factories - and deliberate use of neat solvents in those facilities. Studies on usage patterns, exposure controls, safer alternatives and the potential effects of restrictions are necessary before restrictions can be proposed. Any potential ZDHC MRSL limits will need to be established collaboratively with groups who are working in parallel to study solvents in relation to workplace safety, air emissions, RSL compliance and downstream concerns. |
| 67-56-1 | Methanol | In Version 3 of the ZDHC MRSL it is intended to place restrictions on certain solvents with certain specific hazardous properties (e.g. CMR's). The restrictions are likely to apply to the inclusion of such solvents in formulations for use by wet processors and product assembly factories - and deliberate use of neat solvents in those facilities. Studies on usage patterns, exposure controls, safer alternatives and the potential effects of restrictions are necessary before restrictions can be proposed. Any potential ZDHC MRSL limits will need to be established collaboratively with groups who are working in parallel to study solvents in relation to workplace safety, air emissions, RSL compliance and downstream concerns. |
| 100-41-4 | Ethylbenzene | In Version 3 of the ZDHC MRSL it is intended to place restrictions on certain solvents with certain specific hazardous properties (e.g. CMR's). The restrictions are likely to apply to the inclusion of such solvents in formulations for use by wet processors and product assembly factories - and deliberate use of neat solvents in those facilities. Studies on usage patterns, exposure controls, safer alternatives and the potential effects of restrictions are necessary before restrictions can be proposed. Any potential ZDHC MRSL limits will need to be established collaboratively with groups who are working in parallel to study solvents in relation to workplace safety, air emissions, RSL compliance and downstream concerns. |
| 111-77-3 | 2-(2-methoxyethoxy)-ethanol | In Version 3 of the ZDHC MRSL it is intended to place restrictions on certain solvents with certain specific hazardous properties (e.g. CMR's). The restrictions are likely to apply to the inclusion of such solvents in formulations for use by wet processors and product assembly factories - and deliberate use of neat solvents in those facilities. Studies on usage patterns, exposure controls, safer alternatives and the potential effects of restrictions are necessary before restrictions can be proposed. Any potential ZDHC MRSL limits will need to be established collaboratively with groups who are working in parallel to study solvents in relation to workplace safety, air emissions, RSL compliance and downstream concerns. |

Solvents

| CASNO | Substance | Intent |
|----------|--|--|
| 872-50-4 | N-Methyl-2-Pyrrolidone; 1-methyl-2-pyrrolidone (NMP) | With the exception of textile and leather coating processes, where no viable alternative solvent is currently available, the deliberate use of NMP, DMAC and DMFa should be avoided and their presence in all formulations carefully monitored to ensure compliance with product RSLs and the EU regulation for CMR chemicals, 2018/1513. It is intended to publish limits for maximum allowable limits in Version 3 of the ZDHC MRSL. |
| 68-12-2 | Dimethyl formamide; N,N-dimethylformamide (DMFa) | With the exception of textile and leather coating processes, where no viable alternative solvent is currently available, the deliberate use of NMP, DMAC and DMFa should be avoided and their presence in all formulations carefully monitored to ensure compliance with product RSLs and the EU regulation for CMR chemicals, 2018/1513. It is intended to publish limits for maximum allowable limits in Version 3 of the ZDHC MRSL. |
| 127-19-5 | N,N-dimethylacetamide (DMAC) | With the exception of textile and leather coating processes, where no viable alternative solvent is currently available, the deliberate use of NMP, DMAC and DMFa should be avoided and their presence in all formulations carefully monitored to ensure compliance with product RSLs and the EU regulation for CMR chemicals, 2018/1513. It is intended to publish limits for maximum allowable limits in Version 3 of the ZDHC MRSL. |

Total Heavy Metals

Potential Uses in Apparel and Footwear Textile Processing

Besides in dyes and pigments, metals are used as raw material for trims and other components.

| CASNO | Substance | Intent |
|----------|----------------------------|--|
| Multiple | Metals (Non -dye /pigment) | In Version 3 of the ZDHC MRSL it is intended to place restrictions on the maximum permitted levels of certain metals in (non-dye/pigment) formulations. Studies on usage patterns of metal containing chemicals and formulations and the potential effect of restrictions are required to determine appropriate levels and any possible derogations. |

Dyes – Carcinogenic or Equivalent Concern

Potential Uses in Apparel and Footwear Textile Processing

Most of these substances are regulated and should no longer be used for the dyeing of textiles.

| CASNO | Substance | General Techniques for Analysing Chemicals |
|----------|---------------------------|--|
| 60-11-7 | C I Solvent yellow 2 | For appropriate test methods please consult your third party service provider. |
| 81-88-9 | D&C Red No. 19 | For appropriate test methods please consult your third party service provider. |
| 842-07-9 | C.I. Solvent yellow 14 | For appropriate test methods please consult your third party service provider. |

Other/Misceleanous Chemicals

Potential Uses in Apparel and Footwear Textile Processing

Dye

| CASNO | Substance | General Techniques for Analysing Chemicals |
|-----------|---------------------------|--|
| 2465-27-2 | Auramine hydrochloride | For appropriate test methods please consult your third party service provider. |

Solvents

Potential Uses in Apparel and Footwear Textile Processing

In the past, it was used to make several types of polymers, resins, and textiles, but its use is now highly restricted.

| CASNO | Substance | General Techniques for Analysing Chemicals |
|----------|--------------------------|--|
| 542-88-1 | Bis (chloromethyl) ether | For appropriate test methods please consult your third party service provider. |

FOOTNOTES:

*R,F,A refers to Rubber, Foams and Adhesives

"Sum of substances1 =" means the limit refers to the sum of all the substances with the same number