Camera Nazionale della Moda Italiana

GUIDELINES

ON THE ECO-TOXICOLOGICAL REQUIREMENTS FOR CHEMICAL MIXTURES AND INDUSTRIAL DISCHARGES

IN COLLABORATION WITH

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FEDERAZIONE TESSILE E MODA

Associazione Tessile e Salute

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1. SCOPE OF GUIDELINES ON CHEMICAL MIXTURES

These guidelines on eco-toxicological requisites for chemical mixtures and industrial discharges (the "Guidelines on Chemical Mixtures") follow those we have already published on products and are intended to encourage the adoption of models of responsible management of production processes (textiles, leather, chemicals, etc.).
They also explain how to manage relations with chemical companies for the purposes of complying with our *Guidelines on the eco-toxicological requisites of articles of clothing, leather goods, footwear and accessories* (published by Camera Nazionale della Moda Italiana) and safeguarding health and the environment by helping the industries involved to approach such issues in a more coherent, rational and informed manner.

These Guidelines on Chemical Mixtures and Industrial Discharges refer mainly to production processes and how they are managed, subjects which will be treated in separate guidelines on specific processes shortly to be published by Camera Nazionale della Moda Italiana.

Thanks to ongoing dialogue and collaboration between brands, manufacturing companies, chemicals producers, laboratories, trade associations and government, our Guidelines on Chemical Mixtures form an instrument in continual evolution and will therefore be subject to periodical revision in step with new developments in international legislation, research on risks and toxicology and best available technologies.

2. FIELD OF APPLICATION

This document applies to chemical mixtures used in all production processes, including the washing of equipment and piping, and therefore to a company's entire production, which must be fully under control in order to avoid undesired contamination in its various processes.
Our Guidelines on Chemical Mixtures also apply to manufacturing companies' industrial discharges or, to be more precise, emissions into water. In the case of businesses that send their emissions (whether or not treated) to an external waste treatment plant, the Guidelines on Chemical Mixtures apply to both the company's emissions and those of the external waste treatment plant.

Compliance with these Guidelines on Chemical Mixtures does not prejudice compliance with any legal requisites, is voluntary and may be organized in line with differing business policies.

3. SOURCES USED IN DRAFTING THE GUIDELINES ON CHEMICAL MIXTURES

In drafting the Guidelines on Chemical Mixtures we referred to requisites to be found in the main:

a) national and international laws applicable (eg. the European Union REACH regulation, the Toxic Substances Control Act (TSCA) of the United States Environmental Protection Agency (EPA), the Canadian Environmental Production Act (CEPA) 1999, the European Union framework for community action in the field of water policy (Directive 2000/60/EC);

b) international technical standards (eg. ISO 14001, ISO 18001, ISO 17025 and the ecological criteria of the European Ecolabel (EU Resolutions 2017/1392, 2014/350/EU and 2009/563/EC);

c) industry technical specifications and protocols (eg. the unique characteristics of the Italian supply chain, industry-specific studies and research, international initiatives, such as the ZDHC programme, and other challenging initiatives).

To render information and interpretation of data as uniform as possible, and also optimize synergies between the various parties involved, we considered the possibility of adopting analysis methods and relative detection limits standardized and/or shared, if existing, at the laboratories of chemical companies and/or at accredited laboratories.

Regarding industrial wastewater discharges, we considered the two types of discharge provided for in Italian law: to surface water and to sewerage.
Given the extreme complexity of the subject, we drew up separate summaries, in table form, of the reference parameters for families of chemical substances in chemical mixtures (“Chemical Mixture Summary Table”) and industrial discharges (“Industrial Discharges Summary Table”) using the approaches outlined below.

CHEMICAL MIXTURE SUMMARY TABLE

a) ”Proactive”: this approach considers the limits for residues of substances in chemical mixtures set by the most restrictive international legal requisites, as well as voluntary parameters including or going beyond the legal values.

b) **”Advanced”:** this considers industry-specific requirements proposed as objectives to achieve for the purpose of ongoing improvement and involving the identification and adoption of the best technologies available. Such objectives may be pursued by means of training and awareness raising all along the supply chain and will be subject to periodical review (and any relevant new legislation).

INDUSTRIAL DISCHARGES SUMMARY TABLE

a) ”Proactive”: this approach considers the limits for residues of substances in discharges set by the most restrictive international legal requisites, as well as voluntary parameters including or going beyond the legal values.

b) **”Advanced”:** this considers industry-specific requirements proposed as objectives to achieve for the purpose of ongoing improvement and involving the identification and adoption of the best technologies available. Such objectives may be pursued by means of training and awareness raising all along the supply chain and will be subject to periodical review (and any relevant new legislation).

4. TERMS AND DEFINITIONS

To aid consultation, the main terms used in these Guidelines on Chemical Mixtures are defined below.

Chemical substance
A chemical element or its compounds in a natural state or obtained by a production process and including any additives needed to maintain its stability and any impurities deriving from the process used but excluding solvents that may be separated out without affecting the stability of the substance or altering its composition (Art. 3, c. 1, EC Regulation 1907/2006).

Chemical mixture
A mixture or solution comprising two or more substances (Art. 3, c. 2, EC Regulation 1907/2006).

Family of substances
A group of chemical substances having a common chemical structure and/or functional affinity.

CAS
A CAS RN (Chemical Abstracts Service Registry Number) is a number that identifies a chemical substance.

Hazardous substances
Substances that are classified as hazardous for human health and/or the environment on the basis of international classification criteria (Globally Harmonized System (GHS), implemented in Europe under CLP Regulation 1272/2008).

D.L. (L.O.D. Limit Of Detection)
“Detection Limit”, the minimum concentration measurable using the reference analytical method.

L.O.Q. (Limit Of Quantification)
The lowest concentration of analyte that can be determined with an acceptable level of repeatability precision and trueness

N.D.
“Not Detectable”, i.e. under the detection limit.

Analytical method
A laboratory analysis method involving actions and instruments designed to determine the type (qualitative analysis) and/or amount (quantitative analysis) of a substance or group di substances.

Surface water
Water that forms a distinctive and significant feature on the surface of the planet, such as lake, an artificial reservoir, a stream, river or canal.

Sewerage
A system of sewers collecting wastewater and transferring it to a consortile treatment plant.

Purification steps

- Coarse screening: the first phase, before purification, to remove bulky substances (>2 cm).
- Homogenization: an operation that regulates variable flow rates in compensation tanks, usually upstream of the purification treatment.

Surfactants

A group of organic substances that are the main constituents of formulations used in industrial cleaning. They are categorized as non-ionic, anionic or cationic.

- **Non-ionic surfactants**
  Clusters of organic molecules formed by a hydrophobic component (linear or branching hydrocarbon chain) and an uncharged hydrophilic one (ethoxylate, ether, ester or amide group). In analytical testing, non-ionic surfactants are usually indicated with the acronym BiAS (*Bismuth Active Substances*).

- **Anionic surfactants**
  Clusters of organic molecules formed by a hydrophobic component (linear or branching hydrocarbon chain) and a negatively charged hydrophilic one (sulphonate or sulphate anion). They are indicated with the acronym MBAS (Methylene Blue Active Substances), which refers to the method for testing for them. They are fairly strong detergents but have low germicidal power.

- **Cationic surfactants**
  Clusters of organic molecules formed by a hydrophobic component (linear or branching hydrocarbon chain) and a positively charged hydrophilic one (quaternary ammonium group). They are fairly strong disinfectants but have low detergent power.

Biological treatment

Treatment involving processes based on the biodegradation by micro-organisms of organic substances in the water to purify. Activated sludge is one of the most commonly used techniques (on account of its high efficiency).

- **Activated sludge**
  This process is based on aerobic bacterial fermentation provided by bacteria living in the sludge in aeration tanks to which the wastewater to treat is sent. Air is injected by ventilators to create the right conditions for the aerobic bacteria to grow. Sludge plus bacteria thus constitute activated sludge. This technique makes it

possible to reduce BOD (Biological Oxygen Demand) (by up to 90%), COD (Chemical Oxygen Demand), solids in suspension, nitrogen and phosphorous.

Sedimentation
This is done in special decantation tanks to separate out the sedimentable solids in suspension.

Flocculation
A process in which non-sedimentable substances in suspension form bigger and heavier aggregates that precipitate to the bottom of the tank. Flocculation is induced by adding certain chemical products.

Nitrification and denitrification
Processes that biologically remove ammoniacal, nitric and nitrous nitrogen. Nitrification is carried out by aerobic bacteria capable of obtaining the energy needed for their metabolism from the oxidation of ammoniacal nitrogen, which is broken down into nitrite and then nitrate. Denitrification is a biological process performed by certain bacteria in which nitrates are converted into gaseous nitrogen. The process takes place in anoxic conditions.

Filtration
This is used to remove solids in suspension sized between a millimetre and a micron. Wastewater passes through different types of filter.

- **Membrane filtration**
  This consists of passing wastewater under pressure through a thin membrane that acts as a filter.

Ozonization
Ozone is one of the most powerful oxidants used in water treatment. Ozonization is particularly efficient in removing colour and lowering residual COD, and normally enables treated water to be recovered for use in certain phases of production cycles.

Reverse osmosis
This is high pressure filtration through a membrane of micropores. The reverse of natural osmosis, it expels highly pure water and retains the solutes.

Eutrophication
This term is associated with excessive development of vegetable organisms caused by excessive amounts of nutrient substances such as nitrogen, phosphorous or sulphur in an aquatic ecosystem.

Chemical precipitation

This is the phenomenon in which a solute (also known as precipitate) present in a solution in a concentration greater than its solubility limit separates out in solid form. Before such precipitation, the solution is oversaturated with the solute.
Separation may be triggered by a chemical reaction (increasing the concentration of the solute in the solution to over the solubility limit) or a change in the physical state of the solution, such as temperature (causing a variation in the maximum concentration of solute that the solution can dissolve).

5. CHEMICAL SUPPLY CHAIN

To aid comprehension of the subject matter of these Guidelines and mindful of the fact that compliance with the requisites stated herein depends on how chemical substances are used, we decided to share certain basic considerations on the operation of chemical supply chain.

The use of sustainable alternative chemical substances, where available, is always preferable, given the environmental but also technical, economic and social aspects of the possible alternatives.
Chemical production processes must adopt good manufacturing practices because the ways of using substances may vary significantly (depending, for example, on the chemical substances used, their dangerousness and the types of machinery or processing cycles involved) and because certain potentially hazardous substances for which there are at present no sustainable alternatives may eventually become usable only under strictly controlled conditions.

It should also be remembered that chemistry, the science that studies the composition and transformation of matter, teaches us that molecules interact to form bonds and new molecules. In most cases such processes don’t happen on their own but are induced industrially through chemical synthesis.

Chemical reactions also happen in nature however, and in this case they're spontaneous. Spontaneous reactions may also occur in industrial chemical products (albeit rarely) due to degradation of the original molecules or contamination with other substances involved in processes.

To this end, it should be remembered that certain hazardous substances exist naturally in the air, organisms and food and drinking water, so limits should never be lower than such natural quantities.

The chemical industry is under obligation to fully comply with restrictive national and international legislation and regulations and therefore to supply substances and mixtures that conform to them.

In a spirit of continual improvement, these Guidelines are also intended to spur the supply chain and, particularly, the producers of chemical substances used for articles processing. This in order to improve the global impact of their production, going beyond the current regulatory requirements that, in Europe, have had important changes in recent years, acting as a driving force for the textile industry in the rest of the world, where regulations are much less stringent.

6. INFORMATION ON CERTAIN FAMILIES OF SUBSTANCES

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6.1 Phytosanitary products

Phytosanitary products (crop protection products or pesticides) include all products, synthetic or natural, that are used to combat the main diseases in plants (infectious diseases, physiopathologies, animal parasites and herbivores, weeds).
The possible presence of phytosanitary products on clothing, footwear, leather goods and accessories may be caused by their use in the cultivation of vegetable textile fibres (eg. herbicides and pesticides), or the use of raw materials of vegetable origin in the production of chemical mixtures.
No intentional use, where their presence is presumed, chemical companies must declare the fact.

6.2 Alkylphenol ethoxylates and Nonylphenol ethoxylates

APs (*Alkylphenols*), including *Nonyl-phenol (NP),* are precursors of surfactant molecules, such as APEOs (*Alkylphenol ethoxylates),* including *Nonyl-Phenol Ethoxylate (NPEOs),* and form a vast category of non-ionic surfactants characterized by excellent performance both as detergents and emulsifiers and dispersants.

In Europe they were used as the main components in detergent agents for washing and bleaching textile products, as finishing aids (dispersants, fulling agents,…), in spinning lubricants and as degreasing agents for leather.
Their use in our industry in Europe and various other countries has been subject to severe limitation for some years and they are longer used as components in chemical formulations or production processes.

In Europe, the regulatory reference is Regulation (EU) 2016/26 (which adds a new entry to Annex XVII to REACH-*The list of restrictions contains those substances for which*

manufacture, placing on the market or use is limited or banned in the European Union, p. tp 46 and 46a (3)), however in some non-EU countries they are still used as industrial detergents in the washing of equipment and in general as detergents.
They should not be used as intended for European chemical companies as intentional components.

6.3 Carcinogenic aromatic amines

Aromatic amines are aromatic hydrocarbons to which at least one amine group has been added. They are intermediates in the synthesis of many synthetic colourants.
In almost all classes of dyes there are colourants with an azo structure (azo group –N=N- between two aromatic rings): some of them, due to the breaking of the chemical bonds (reduction/splitting), can free one or more aromatic amines that are carcinogenic or potentially carcinogenic for humans and can also be present as impurities. As such they are regulated by CE 552/2009 Regulation amending the REACH Annex XVII.

In line with the main international laws and the requisites indicated in these Guidelines on Chemical Mixtures, colourants/dyes may, if used correctly, guarantee compliance with the limits set by the Guidelines for Products.

6.4 Chlorinated benzenes and toluenes - chlorobenzenes

Chlorobenzenes are a group of substances in which the benzene ring has one or more hydrogen atoms (H) substituted by chlorine atoms (Cl).
They are used mainly as intermediates in the production of other chemical substances and may be present as impurities in chemical formulations (eg. colourants and biocides).
Chlorinated benzenes and toluenes were used as carriers for dyeing synthetic fibres, especially polyester, to increase absorption and diffusion of the colourants inside fibres in dyeing processes carried out at low temperatures and ambient pressure. In Europe their use in such processes has now disappeared. Polyester is dyed without a carrier, under pressure at around 130° C.
Other uses now superseded include the dyeing of certain wool-polyester mixes or as levelling agents in the dyeing, printing and coating of textile materials and leather in general.

Substances/mixtures must not contain chlorobenzenes or chlorinated benzenes or toluenes as components that are intentional or known in the production process.

6.5 Biocides

Biocides are chemicals used to preserve and maintain the characteristics of the products from a microbiological point of view.
The use of biocides is regulated at European level by the EU Regulation 528/2012, with a positive list of permitted substances and with possible limits of use.
Chemical companies must declare the type and quantity of biocides used.

6.6 Chlorophenols – chlorinated phenols

Chlorophenols are a group of substances with chlorine atoms linked to phenols and include all the isomers of mono-, di-, tri-, tetra- and penta-chlorophenol.
Pentachlorophenol (PCP) and tetrachlorophenol and its salts (TeCP) were widely used in the past as herbicides, fungicides, insecticides and anti-algae agents.
In Europe they have not been used as preservatives for some years. They may also be used in other countries or be present as residues in products of plant origin.

Substances/mixtures must not contain Chlorophenols as components that are intentional or known in the production process.

6.7 Allergenic and carcinogenic colourants

Most colourants in which allergenic effects have been identified belong to the class of dispersed colourants. This class of colourants is formed by molecules which are without polar groups capable of making the colourant soluble in water: in fact they disperse in it but do not dissolve. This characteristic makes these colourants similar to lipophilic structures like skin.
Some dispersed colourants are also carcinogenic even though they do not contain azo groups capable of freeing the carcinogenic aromatic amines in 6.3 above.
Dispersed colourants are used mainly in the dyeing of polyester and acetate but also polyamide.

Substances/mixtures must not contain allergenic or carcinogenic colourants as components that are intentional or known in the production process. Minor pollution events may, however, be caused by cross-contamination during production processes.

6.8 Perfluorinated compounds

Perfluorinated compounds (PFCs) are formed by fluorine and carbon.
They can be used in finishes requiring water repellence, stain resistance and oil repellence (treatment commonly known as DWR - Durable Water Repellent) for work clothes,

uniforms, medical fabrics, outdoor clothing, etc.
Substances/mixtures must not contain PFOS or PFOA or their respective degradation sub-products as components that are intentional or known in the production process.
Chemical companies must declare not to use PFOS and PFOA.

In cases where other fluorinated compounds, not subject to legal restrictions, are present in formulations used to confer the oil repellency feature to the article, chemical companies must declare it.

6.9 Organotin compounds

Organotin compounds are those that contain at least one tin-carbon bond.
Di-organic tin compounds are used as thermal stabilizers in the production of PVC or as catalysts in the production of polymer materials (eg., polyurethane (PU), polyester or polymers of self-crosslinking silicone). They may also be contained in silicone-based finishes (eg. for their elastomeric and hydro-repellent properties).
Substances/mixtures must not contain organotin compounds as components that are intentional or known in the production process. Pollution caused by cross-contamination during production processes must be limited to events that can be considered of little significance.

6.10 Formaldehyde

Formaldehyde is a highly reactive volatile organic compound and, as such, is ubiquitous and may be found anywhere.
It is produced industrially but also generated in a number of processes of degradation of natural organic molecules and present in many foods (eg. fruit and vegetables, meat, fish, crustaceans and dried mushrooms, etc.), partly as an impurity in treatment and preservation processes but above all because it's present as a metabolic intermediate in various organisms.

Its capacity to inactivate microorganisms made it an active ingredient in biocides (anti-mould, etc.) both directly and indirectly (formaldehyde donors) but its main and current use is limited to the production of polymers, especially urea-formaldehyde (UF), melamine-formaldehyde (MF) and phenol-formaldehyde (PF) resins.

Given its extreme versatility, formaldehyde is used industrially across a wide range of applications, including:

- in the textile sector: anti-crease and anti-stain fixative, intermediate in the production of elastomeric fibres, a component in colouring agent fixatives for fabrics

and prints, a component in levelling agents and dispersants and synthetic tannins used as fixatives for acid colourants;

- in the leather sector: production of polyurethane polymers in aqueous dispersion and acrylic polymers in aqueous emulsion for leather finishing; for crosslinking casein solutions, and in tannins as a re-tanning agent in the wet phases of leather treatment.

It is necessary to obtain from chemical producers statements indicating:

a. chemical mixtures that do not have formaldehyde as a component known or present in their production cycles or that are not known to release formaldehyde via degradation processes or as process impurities;
b. chemical mixtures that do not have formaldehyde as a component known or present in their production cycles but that may release it from degradation processes or contain it as process impurities;
c. products that have formaldehyde as a component known or present in their production cycles.

In the cases of b) and c) above, the supplier must also specify the reference quantity values.

6.11 Phthalates

Phthalates (phthalic acid esters) are compounds used above all as plasticizers in the plastics industry.
They are used mainly in the production of “soft” plastic articles, for they render material very flexible and deformable. They can be found in both textile articles and skins and leather.
There is a risk of their being found in prints, coatings/linings, plastics, adhesives and sometimes in nitro paints (nitro lacquers), where they are used as plasticizers.
Chemical companies that do not use plasticizers may declare that they do not use phthalates in the production cycle.

6.12 Polycyclic aromatic hydrocarbons (PAHs)

These are hydrocarbons with a complex structure consisting of two or more aromatic rings. They may be present as impurities or degradation products in certain raw materials used in the production of chemical mixtures and colourants or come from combustion processes.
PAHs are not easily soluble in water, do not evaporate and do not readily degrade.
They have been found not only in rubber but also in numerous plastics (ABS, PP, naphthalene resins…). The main causes of PAH contamination include: plasticizing oils

used in the production of rubber and plastics, ashes for the black pigment of rubber and plastics, contaminated lacquers.
In general, chemical products are not subject to known contamination from PAHs and do not contain PAHs. Should a chemical company become aware of a possible presence of PAHs in a given type of product (eg. formulations with hydrocarbons), it must declare the maximum levels expected.

6.13 Isocyanates

The isocyanates are a group of aromatic or aliphatic compounds of low molecular weight containing the isocyanate radical.
They can also be used in the dressing of leather, in adhesives for footwear and in coatings for textiles.
The isocyanates react with functional groups containing active hydrogens (eg OH, NH, COOH) to produce polymers that make up polyurethane foams, thermoplastic elastomers, elastan, polyurethane paints, etc.

The presence of free isocyanates in the formulation of chemical mixtures is restricted to certain crosslinkers and fixatives and must be declared (chemical producers must declare known presence), whereas isocyanates do not occur in aqueous polyurethane dispersion because of the isocyanate group's reactivity with water.

6.14 Heavy metals

Heavy metals are natural substances that are found in numerous types of material.
Detailed below are the metals in question here and their possible applications.

- Antimony (Sb): used as a catalyst in the production of polyester fibres.
- Arsenic (As): its compounds are used mainly in crop protection products, herbicides and insecticides. They are not normally used in textile applications but they may be found in recycled materials and some colours/glass.
- Cadmium (Cd): was widely used as a stabilizer of plastics (PVC); it can also be found in metallic accessories, glass and colourants/paints (usually red, orange, yellow, green).
- Cobalt (Co): used in the production of inks, paints and colourants.
- Chromium (Cr): the most dangerous form is hexavalent Cr, which is rare in nature but can be found in textiles and leather articles. In textiles, hexavalent chromium can be found in articles dyed with post-chromate conversion colourants, when conditions have not been thoroughly controlled. In leather articles on the other hand, hexavalent chromium may be present because it's formed in the presence of

oxidizing substances used in tanning. Cr and its compounds are also used in the production of metal complex colourants.

- Mercury (Hg): deemed to be totally excluded from textile and leather processes. It may sometimes be found as a contaminant in certain low quality catalytic processes.
- Nickel (Ni): widely used in surface treatments for numerous metallic accessories in common use in the clothing and footwear sectors.
- Lead (Pb): in the textiles and leather sectors lead may be associated with the use of paints and pigments, as well as being found in certain alloys for metallic accessories and glass.
- Copper (Cu): in the textiles and leather sectors copper may be present in certain metal complex colourants or used as a mordant to increase the light fastness of certain colourants. It may also be found in a number of metallic components/as a base for galvanizing treatments.

Heavy metals may also be found in chemical mixtures as come “drag” from the surfaces of equipment, mixers and reactors used in processes and phases of chemical mixture production. In such cases they are traces.
In reference to dyes and pigments, chemical companies generally:

- Must declare that substances/mixtures do not contain metals as components that are intentional or known in the production process.; the eventual presence of metals must refer to the limits defined by these Guidelines (that refer to the ETAD limits “the Ecological Association of Dyes and Organic Pigments Manufacturers”);

- For dyes, metal complex pigments and inorganic pigments, the limits indicated in these guidelines are not applicable if metals are an integral part of them

- If the metal is an intentional component of the chemical mixture, the chemical companies must declare its presence.

6.15 Nitrosamines

Nitrosamines are organic compounds containing a nitrous group, -N=O, bonded to an amine.
Nitrosamines and their precursors may be deliberately added during the manufacturing of natural and synthetic rubbers. They are used as constituents of accelerators, anti-oxidants and reinforcing agents to give the end product strength and elasticity.
Nitrosamines may be generated from their precursors to provide secondary products in processes for rubber production and storage. They may therefore be found only in rubbers.

6.16 Short-chain chlorinated paraffins

Short-chain chlorinated paraffins (SCCPs) are complex mixtures of polychlorinated hydrocarbons.
Their main use is as lubricant additives in fluids for metal working processes. They are also used as flame retardants, plasticizers for rubbers, paints and adhesives.
Minor uses include greasing and softening agents in the leather industry, impregnating agents in the textiles industry and additives for sealing compounds.
Chemical companies must declare that they do not intentionally use them.

6.17 Flame retardants

There are two classes of products normally regulated: brominated or chlorinated flame retardants (eg. PBB, PBDEs, TCEP) and organophosphate flame retardants (eg. TRIS and TEPA).
Brominated flame retardants (organobromine compounds) or chlorinated retardants (chlorinated hydrocarbon-based) are mixtures of artificial chemical substances that may be added to a wide range of products, also for industrial use, to make them less inflammable, as they have high stability and a capacity to diminish flame propagation.
The term organophosphate (sometime abbreviated to OP) refers generically to the esters of phosphoric acid.
Some of their compounds based on production processes containing chlorine, such as tri (2-chloroethyle) phosphate (TCEP), tri (2-chlorine-1-methyl) phosphate (TCPP) and tris (1,3-dichloro-2-propyl) phosphate (TDCP), are used to reduce the inflammability of materials, as are the non-chlorinated POs such as tris (2-butoxyethyl) phosphate (TBEP), tri-iso-butyl phosphate (TiBP) and tri-n-butyl phosphate (TnBP).
The use of a halogen-based flame retardant in a chemical mixture, used to guarantee the specific performance of an article, must be declared by the chemical company indicating the substances contained.
In other cases the chemical company must declare no intentional use.

6.18 Organic solvents

Organic solvents are widely used in industry and day-to-day life. They may be found in paints, nitro-lacquers, adhesives, colourants.
The term covers many families of chemicals widely used in numerous chemical product manufacturing processes relevant to the fashion industry.
The substances / mixtures must not contain the organic solvents considered by these Guidelines (see reference tables).

If an organic solvent is used in the formulation of a mixture, the chemical company must declare it if its concentration is equal to or greater than 0.1% by weight (since it is classified as SVHC, Substance of Very High Concern, by the REACH regulation), i.e. in significant concentrations for health and the environment.

6.19 Chlorinated solvents

Chlorinated solvents are halogenated aliphatic solvents also used in certain cases in the textiles and leather sectors.
Some of the solvents considered could still be used in the manufacturing processes of components of chemical mixtures.
Chemical companies must declare not to use them, or declare their eventual presence

6.20 Chemical parameters for wastewater

TSS (Total Suspended Solids): these are particles bigger than 0.45 μm. Such substances make water opaque or turbid by preventing light transmission (thus making water unfit for aquatic organisms) and may subsequently sediment. They may be eliminated in various treatment phases (sedimentation, flocculation and filtration, as well as biological degradation by activated sludge in the case of organic substances).
BOD (Biological Oxygen Demand): this expresses the amount of oxygen needed to biochemically oxidize the substances in the water. It's an indicator of the pollutant load of industrial discharges. The parameter is lowered in the biological oxidization phase (activated sludge) and by using active carbon.
COD (Chemical Oxygen Demand): this is the amount of oxygen needed to chemically oxidize the substances in the water. This parameter can be lowered in the oxidization phase or by tertiary treatment with active carbon.
Chlorates, sulphates and phosphates: these come from use of chemical products in production processes. Such parameters can be lowered by passing water through membrane filters, reverse osmosis or by means of chemical precipitation reactions; phosphates can be eliminated by biological depuration.
N-NH4, N-NO2, N-NO3: ammonia is used as a basic reagent in production processes, while nitrates are present in certain surfactants. The three chemical species are interconnected and linked to the chemical equilibrium of wastewater. Such pollutants are generally removed by biological techniques (activated sludge or nitrification-denitrification treatment).
Surfactants: most of the products used in production cycles (detergents and auxiliaries) may be classed as surfactants and subdivided into non-ionic (B.I.A.S.), anionic (M.B.A.S.) and cationic. Given their widespread use, they are a serious problem for water courses.

While increasing eutrophication, their most visible effect is the formation of foam, which creates a barrier at the air-water contact surface, thus inhibiting oxygenation (and thereby also aquatic life and biodegradation of organic substances by aerobic organisms). In treatment plants they prevent or slow down the coagulation and filtration phases. Tertiary treatments like ozonization and active carbon have proved more efficient in the treatment of surfactants.

Total P: Il phosphorous in wastewater is mainly inorganic (fertilizer orthophosphates and detergent polyphosphates). Abundance of phosphates in solution, along with a certain quantity of nitrogen compounds (mostly nitrates), causes eutrophication.

Total cyanides: hydrocyanic acid compounds are used in certain industrial processes.

Sulphites: there is fairly widespread use of sulphites in industry because of their marked reduction properties and the solubility of their salts.

Sulphides: certain industrial processes are major sources of sulphides, such as waste products from mineral processing (metallurgy).

7. SUMMARY: REFERENCE PARAMETERS OF FAMILIES OF CHEMICAL SUBSTANCES IN CHEMICAL MIXTURES

Taking into account that analytical methods for the analysis of impurities or substances of interest in chemical mixtures are almost never described in specific harmonized technical standards and the complexity of chemical matrices, the reference methods are indicated in this table.

Moreover, compared to the previous Guidelines on the articles, the column Reference Standards has been inserted.

For a correct reading of the table it is therefore necessary to consider that:

- the methods indicated in the Analytical Method column are used in the laboratories referred to in point 3 "Premises for the drafting of the mixtures guidelines", monitored and deepened also through interlaboratory tests, but are not binding as regards the indication of the preparation method ;
- the methods indicated in the Reference Standards column, even though almost never for chemical mixtures (but for example for textiles, leather, water) can form a basis for developing specific methodologies for these;
- with regard to the Detection Limit (DL), the indicated value may not be applicable in some circumstances, due to the complexity of the reference matrices.

The tests performed by third parties must be carried out in ISO17025 accredited laboratories and must be able to comply with the provisions of these Guidelines

Chemical substance families	Proactive	Advanced	Analytical methods	DL detection limits	Notes	Reference standards
Phytosanitary products)	See note	n.a.	-PREPARATIONS: extraction of sample in 1:1 hexane:acetone mixture -INSTRUMENTAL MEASUREMENT: GC-MS/MS	0.2 mg/kg	No intentional use; only contamination from raw materials of vegetable origin is contemplated. Where their presence is presumed, chemical companies must declare the fact.	EPA 8081B - Organochloride pesticides by gas chromatography EPA 8141B - Organophosphorus compounds by gas chromatography EPA 8270D - Semivolatile organic compounds by gas chromatography
Alkylphenols Alkylphenol ethoxylates	100 mg/kg 300 mg/kg for colourants	1 mg/kg	Alkylphenol ethoxylates: - PREPARATIONS: extraction of sample in methanol. -INSTRUMENTAL MEASUREMENT: LC-MS or LC-MS/MS Alchylphenols: - PREPARATIONS: -- Liquids: solubilization of sample in water; liquid/liquid extraction with suitable organic solvent -- solids: extraction in methanol -INSTRUMENTAL MEASUREMENT: GC-MS	1 mg/kg		ISO 18218-2 Leather -- Leather -- Determination of ethoxylated alkylphenols, Indirect method (section 6.2) . ISO 18218-1Leather - - Determination of ethoxylated alkylphenols, Direct method (section 7,1). ISO 18857-1 Water quality - determination of selected alkylphenols - Part 1: Method for non-filtered samples by liquid-liquid extraction and gas chromatography with selective mass detector
Carcinogenic aromatic amines	150 mg/kg	5 mg/kg	PREPARATIONS and analysis method specified in technical standard	5 mg/kg		UNI EN 14632:2017 - Annex F - Methods for determination of certain aromatic amines derived from azo colorants
Chlorinated benzenes and toluenes - chlorobenzenes	50 mg/kg	n.a.	-PREPARATIONS: extraction of sample in dichloromethane -INSTRUMENTAL MEASUREMENT: GC-MS/MS	0.5 mg/kg		DIN 54232 - Determination of the content of bonds based on chlorobenzene and chlorotoluene

Chemical substance families	Proactive	Advanced	Analytical methods	DL detection limits	Notes	Reference standards
Biocides	See note	See note	-PREPARATIONS: extraction of sample in organic solvent -INSTRUMENTAL MEASUREMENT: LC-MS/MS		Chemical companies must declare the use of biocides authorized by EU 528/2012 Reg. and subsequent modifications and integrations.	ISO/NP 22992 - Determination of triclosan residues EN 17134 - Determination of certain preservatives, method using liquid chromatography
Chlorophenols	20 mg/kg TeCP and PCP 50 mg/kg	n.a.	-PREPARATIONS: -- for solid samples: steam distillation, acetylation and LLE extraction For immiscible products in the acqueous phase perform derivatization by continuous agitation or creation of emulsion to stabilize the solution. -- for liquid samples: dilution in potassium carbonate solution, acetylation by continual agitation and LLE extraction -INSTRUMENTAL MEASUREMENT: GC-MS/MS	0.05 mg/kg		ISO 17070 - Determination of tetrachlorophenol-, trichlorophenol-, dichlorophenol-, monochlorophenol-isomers and pentachlorophenol content UNI 11057 - Determination of pentachlorophenol - tetrachlorophenol and relative salts and esters in textiles
Allergenic colourants (dispersed)	See note	n.a.	-PREPARATIONS: -- for solid and liquid samples: extraction in methanol -INSTRUMENTAL MEASUREMENT: LC-MS/MS	5 mg/kg	Substances/mixtures must not contain allergenic or carcinogenic colourants as components that are intentional or known in the production process. However, insignificant pollutions due to cross-contamination can occur during production processes. Chemical companies must declare they do not use them.	ISO 16373-2 - Method for the determination of extractable dyestuffs including allergenic and carcinogenic dyestuffs ISO 16373-3 - Method for determination of certain carcinogenic dyestuffs DIN 54231 - Detection of disperse dyestuffs
Carcinogenic colourants	See note	n.a.		5 mg/kg		
Fluorinated compounds (PFOS and PFOA)	See note	n.a.	-PREPARATIONS: -- for solid samples: extraction in methanol -- for resins including fluorocarbon ones: 1) Extraction with H2O/ammonium acetate (with suitably adjusted pH) 2) SPE C18 phase - elution with acetonitrile or acetonitrile/H2O -INSTRUMENTAL MEASUREMENT: LC-MS/MS	0.01 mg/kg	Chemical companies must declare they do not use them.	CEN/TS 15968 (for the articles and liquids) ISO 25101 Water quality -- Determination of perfluorooctanesulfonate (PFOS) and perfluorooctanoate (PFOA)

Chemical substances families	Proactive	Advanced	Analytical methods	DL detection limits	Notes	Reference standards
Other fluorinated compounds	See note	n.a.	-PREPARATIONS PFAS: -- for solid samples: extraction in methanol -- for resins including fluorocarbon ones: 1) Extraction with H2O/ammonium acetate (with suitably adjusted pH) 2) SPE C18 phase - elution with acetonitrile or acetonitrile/H2O -INSTRUMENTAL MEASUREMENT: LC-MS/MS PREPARATIONS FTOH: -- extraction in methyl tert-butyl ether (MTBE) -INSTRUMENTAL MEASUREMENT: GC-MS/MS,	0.01 mg/kg 0.1 mg/kg per FTOH	In cases where other fluorinated compounds, not subject to legal restrictions, are present in formulations used to confer the oil repellency feature to the article, chemical companies must declare it.	
Organotin compounds	5 mg/kg	1 mg/kg	- PREPARATIONS: - extraction of sample with organic solvent, derivatization and LLE extraction -INSTRUMENTAL MEASUREMENT: GC-MS/MS	0.1 mg/kg		ISO/TS 16179 - Determination of organotin compounds in footwear materials
Free formaldehyde	See note	n.a.	- PREPARATIONS: 1) heating of sample in inert atmosphere (N2) T° 90° C, capture with DNPH vial. 2) elution of DNPH vial with ACN/H2O -INSTRUMENTAL MEASUREMENT: LC-MS/MS	16 mg/kg	Companies can submit a declaration in cases where the substance is not present.	UNI EN ISO 27587 Leather - Chemical testing - determination of free formaldehyde in chemical auxiliaries for leather UNI EN ISO 17226-1 Leather - chemical determination of formaldehyde content - Part 1: Method for high resolution liquid chromatography
Phthalates BBP, DEHP, DIBP, DBP, DINP	n.a.	n.a.	-PREPARATIONS: -- for resins or plastics: solubilization with tetrahydrofuran (THF) treatment -- for liquid samples: extraction with hexane -INSTRUMENTAL MEASUREMENT: GC-MS/MS	5 mg/kg 10 mg/kg per DINP and DIDP		CPSC-CH-C1001-09.3 - Standard Operating Procedure for Determination of Phthalates UNI EN ISO 14389 - Determination of phthalate content -- Tetrahydrofuran method ISO/TS 16181 - Critical substances potentially present in footwear and footwear components -- Determination of phthalates in footwear materials
Other phthalates	somma 250 mg/kg	n.a.		5 mg/kg		

Chemical substances families	Proactive	Advanced	Analytical methods	DL detection limits	Notes	Reference standards
Aromatic polycyclic hydrocarbons	20 mg/kg benzo(a)pyrene, sum 200 mg/kg	2 mg/kg benzo(a)pyrene, sum 20 mg/kg	-PREPARATIONS: - extraction of sample with toluene -INSTRUMENTAL MEASUREMENT: GC-MS/MS Special attention to presence of PAH structural isomers	1 mg/kg	May be a ubiquitous contaminant or a product of degradation/impurity in certain types of products (from hydrocarbons, combustion processes, etc.)	AfPS GS 2014 - Testing and assessment of polycyclic aromatic hydrocarbons (PAHs) in the course of awarding the GS mark ISO/TS 16190 - Critical substances potentially present in footwear and footwear components -- Test method to quantitatively determine polycyclic aromatic hydrocarbons (PAH) in footwear materials
Isocyanates	See note	n.a.	-PREPARATIONS: - extraction of sample with dichloromethane and derivatization with dibutylamine -INSTRUMENTAL MEASUREMENT: LC-MS/MS	1 mg/kg	Chemical companies must declare their presence and relative concentration.	UNI 13130-8 - Materials and articles in contact with food - Substances in plastics subject to limits - Part 8: determination of isocyanates in plastics
HEAVY METALS	**Metal-complex dyes and pigments, inorganic pigments: for metals that are an integral part of these molecules, the limits indicated in the "proactive" and "advanced" columns of this table are not applicable. For chemical mixtures which are not dyes or pigments, take into account the contents of paragraph 6.14 '(Heavy) metals'**					
Antimony	50 mg/kg	25 mg/kg See note	-PREPARATIONS: microwave acid digestion -INSTRUMENTAL MEASUREMENT: ICP-MS ICP-OES	5 mg/kg		ISO 17072-2 - Chemical determination of metal content -- Part 2: Total metal content
Arsenic	50 mg/kg	25 mg/kg See note	-PREPARATIONS: microwave acid digestion -INSTRUMENTAL MEASUREMENT: ICP-MS ICP-OES	1 mg/kg		ISO 17072-2 - Chemical determination of metal content -- Part 2: Total metal content

Chemical substances families	Proactive	Advanced	Analytical methods	DL detection limits	Notes	Reference standards
Cadmium	20 mg/kg	10 mg/kg		1 mg/kg		
Chromium	100 mg/kg, 250 mg/kg oxide based pigments	50 mg/kg		1 mg/kg	This requisite doesn't apply to mineral tanning products based on basic chromium sulphate .	
Chromium VI	10 mg/kg	n.a.	-PREPARATIONS: extraction in buffer solution -INSTRUMENTAL MEASUREMENT: LC-DAD LC-ICP-MS	1 mg/kg		ISO 17075-2 - Chemical determination of chromium(VI) content in leather -- Part 2: Chromatographic method EN 71-3 - Migration of certain elements
Cobalt	50 mg/kg 500 mg/kg colourants and pigments	25 mg/kg 250 mg/kg colourants and pigments	-PREPARATIONS: microwave acid digestion -INSTRUMENTAL MEASUREMENT: ICP-MS ICP-OES	5 mg/kg		ISO 17072-2 - Chemical determination of metal content -- Part 2: Total metal content
Lead	100 mg/kg	40 mg/kg	-PREPARATIONS: microwave acid digestion -INSTRUMENTAL MEASUREMENT: ICP-MS ICP-OES	5 mg/kg		ISO 17072-2 - Chemical determination of metal content -- Part 2: Total metal content
Mercury	4 mg/kg 25 mg/kg pigments	2 mg/kg 10 mg/kg pigments		1 mg/kg		

Families of chemical substances	Proactive	Advanced	Analytical methods	DL detection limits	Notes	Reference standards
Copper	25 mg/kg 250 mg/kg colourants and pigments	10 mg/kg 100 mg/kg colourants and pigments		5 mg/kg		
Nickel	200 mg/kg colourants and pigments 100 mg/kg	100 mg/kg colourants and pigments 50 mg/kg		1 mg/kg		
Nitrosamines	not present in chemical mixtures	not present in chemical mixtures	-PREPARATIONS: extraction of methanol and purification by SPE -INSTRUMENTAL MEASUREMENT: GC-MS/MS			GB/T 24153 - Rubber and elastomer materials— Determination of N-nitrosamines UNI 12868 - Methods for determining release of N-nitrosamines and N-nitrosatable substances from elastomers or rubber teats and soothers.
Orthophenylphenol	500 mg/kg	250 mg/kg	-PREPARATIONS (procedure with derivatization): -- For immiscible products in the acqueous phase perform derivatization by continuous agitation or creation of emulsion to stabilize the solution. -- for solid samples: steam distillation, acetylation and LLE extraction -- for liquid samples: dilution in potassium carbonate solution, acetylation by continual agitation and LLE extraction -INSTRUMENTAL MEASUREMENT: GC-MS/MS -PREPARATIONS (procedure with direct analysis): -- extraction of sample in methanol -INSTRUMENTAL MEASUREMENT: LC-MS/MS	5 mg/kg	Presence must be declared by the chemical companies. The requirement does not apply to products with a specific biocidal function containing orthophenyl phenol as an active ingredient.	Determinazioni mediante derivatization ISO 17070 - Determination of tetrachlorophenol-, trichlorophenol-, dichlorophenol-, monochlorophenol-isomers and pentachlorophenol content UNI 11057 - Determination of pentachlorophenol - tetrachlorophenol and relative salts and esters in textiles Determination by direct analysis ISO 13365 - Determination of the preservative (TCMTB, PCMC, OPP, OIT) content in leather by liquid chromatography

Families of chemical substances	Proactive	Advanced	Analytical methods	DL detection limits	Notes	Reference standards
Short-chain chlorinated paraffins	250 mg/kg 50 mg/kg (come ritardante di fiamma)	50 mg/kg	-PREPARATIONS: extraction of hexane -INSTRUMENTAL MEASUREMENT: GC-ECNI-MS/MS LC-MS/MS	50 mg/kg		ISO 18219 - Determination of chlorinated hydrocarbons in leather -- Chromatographic method for short-chain chlorinated paraffins (SCCP)
Brominated and chlorinated flame retardants	250 mg/kg	50 mg/kg	-PREPARATIONS: - for brominated flame retardants: extraction in toluene - for phosphorated flame retardants: extraction in acetone -INSTRUMENTAL MEASUREMENT: GC-MS/MS (brominated) LC-MS/MS (phosphorated)	5 mg/kg		ISO 17881-1 - Determination of certain flame retardants -- Part 1: Brominated flame retardants ISO 17881-2 - Determination of certain flame retardants -- Part 2: Phosphorus flame retardants
Chlorinated solvents	10 mg/kg	5 mg/kg	INSTRUMENTAL MEASUREMENT: static headspace HS-GC-MS. 1) for samples with high solvent content, it's advisable to perform extraction in methanol and analysis of a portion of the extract diluted in matrix modifier. 2) for solvents like formamide, DMF and DMAC it's advisable to perform extraction in methanol and GC-MS determination.	0.5 mg/kg	Chemical companies must declare either that they don't use them or that presence is possible.	EN ISO 22155 Soil quality -- Gas chromatographic determination of volatile aromatic and halogenated hydrocarbons and selected ethers -- Static headspace method ISO 15680 Water quality -- Gas-chromatographic determination of a number of monocyclic aromatic hydrocarbons, naphthalene and several chlorinated compounds using purge-and-trap and thermal desorption EPA METHOD 5021A volatile organic compounds in various sample matrices using equilibrium headspace analysis
Organic solvents	See note	See note		1 mg/kg		

8. SUMMARY: REFERENCE PARAMETERS OF FAMILIES OF CHEMICAL SUBSTANCES IN INDUSTRIAL DISCHARGES FROM TEXTILES BUSINESS

INTRODUCTION

As already stated in the text, implementation of these Guidelines does not prejudice compliance with the legal requisites and is voluntary. This means that if a company discharges into a seweage collection system that carries wastewater to a centralized - consortile and/or public treatment facility that complies with the limits for discharging to surface water in the table below, the requisites for the textile company's industrial effluents will be deemed satisfied by applying to same the limits legally set by the Competent Authority, even if only in derogation.

Families of chemical substances	Individual parameters	Units of measure	Discharge limits - proactive		Discharge limits - advanced		ANALYTICAL METHOD	DL	NOTES
			Surface water	Sewerage	Surface water	Sewerage			
Basic chemicals	TSS Total Suspended Solids	mg/l	50	160	30	100	ISO 11923, USEPA 160.2, APHA 2540D	1,0 mg/l	
	BOD5	mg/l	30	200	15	100	UNI EN ISO 1899-I:2001; APHA 2012 5210D, ISO 5815-1,-2 , EN 1899-1, USEPA 405.1	5,0 mg/l	
	COD	mg/l	120	400	80	300	CNR ISRA 5130 MAN. 29/03; ISO 15705.2002 , ISO 6060. USEPA 410.4, APHA 5220D	5,0 mg/l	
	N - NH4	mg/l	10	24	9	22	CNR - IRSA MET. 3030 MAN. 29/03; EPA 350.1 1993; UNICHIM 2363: 09, ISO 11732.ISO 7150. EN ISO 11732, APHA 4500 NH□-N	0.5 mg/l	
	N - NO2	mg/l	0.48	0.48	0.44	0.44	CNR - IRSA MET. 4020 MAN. 29/03	0.02 mg/l	
	N- NO3	mg/l	16	24	14	22	CNR - IRSA MET. 4020 MAN. 29/03	1,0 mg/l	
	Cl - Chlorides	mg/l	960	960	860	860	CNR - IRSA MET. 4020 MAN. 29/03	1,0 mg/l	**Parameter that may be disapplied on the basis of the natural conditions of the intake water.**

	F - Fluorides	**mg/l**	4,8	9,6	4,4	8,6	CNR - IRSA MET. 4020 MAN. 29/03	0.15 mg/l	**Parameter that may be disapplied on the basis of the natural conditions of the intake water.**
	SO4 - Sulphates	**mg/l**	800	800	720	720	CNR - IRSA MET. 4020 MAN. 29/03	1,0 mg/l	**Parameter that may be disapplied on the basis of the natural conditions of the intake water.**
	Sulphides like H2S	**mg/l**	0.8	1,6	0.7	1,4	APHA STANDARD METHODS 2012 4500-S; IRSA CNR 2090 MAN. 29/03, ISO 10530	0.1 mg/l	
	SO3 - Sulphites	**mg/l**	0.8	1,6	0.2	1,4	CNR IRSA 4150 Man 29/2003; DIN 38405 D-27, ISO 10304-3, USEPA 377.1	0.1 mg/l	
	CN - Total cyanides	**mg/l**	0.4	0.8	0.3	0.7	M.UNICHIM 2251:08; ISO 6703-1-2-3-1984, ISO 14403-1-2 , USEPA 335.2, APHA 4500-CN	0.01 mg/l	
	MBAS Anionic surfactants	**mg/l**	1,9 sum	3,8 sum	1,8 sum	3,6 sum	CNR IRSA 5170 MAN. 29/03; ISO 7875-1-2-3-1984	0.05 mg/l	
	BIAS - Non-ionic surfactants	**mg/l**					CNR IRSA 5180 MAN. 29/03; UNI 10511-2 (1996)	0.05 mg/l	
	Cationic surfactants	**mg/l**					NOTIZIARIO IRSA E 013-1979	0.05 mg/l	
	Total P - Phosphorous	**mg/l**	5	8	2	7	ISO 6878-1:1986; UNI EN ISO 11885:2009; CNR IRSA 4060 MAN. 29/03, USEPA 365.4, APHA 4500P-J	0.5 mg/l	
Agrofarmaci (prodotti fitosanitari)	**Total pesticides (excluding phosphates)**	**mg/l**	0.04	0.04	0.03	0.03	EPA 3510C 1996 + EPA 8270D 2007; CNR IRSA 5060 MAN. 29/03	0.0010 mg/l	
Crop protection products (phytosanitary products	**- aldrin**	**mg/l**	0.008	0.008	0.008	0.008	EPA 3510C 1996 + EPA 8270D 2007; CNR IRSA 5060 MAN. 29/03	0.0010 mg/l	**The individual crop protection products considered are those regulated by D.Lgs 152/06 and subsequent amendments.**
	- dieldrin	**mg/l**	0.008	0.008	0.008	0.008	EPA 3510C 1996 + EPA 8270D 2007; CNR IRSA 5060 MAN. 29/03	0.0010 mg/l	
	- endrin	**mg/l**	0.0016	0.0016	0.0016	0.0016	EPA 3510C 1996 + EPA 8270D 2007; CNR IRSA 5060 MAN. 29/03	0.0010 mg/l	
	- isodrin	**mg/l**	0.0016	0.0016	0.0016	0.0016	EPA 3510C 1996 + EPA 8270D 2007; CNR IRSA 5060 MAN. 29/03	0.0010 mg/l	
Alkylphenols Alkylphenol ethoxylates	**Nonylphenol, Octylphenol, Alkylphenol ethoxylates, Nonylphenol ethoxylates**	**µg/l**	50 sum	50 sum	5 sum	5 sum	NP/OP: ISO 18857-2: 2009, ASTM D7065 - OPEO/NPEO (n>2): ISO 18254-1	1 µg/l	
Carcinogenic aromatic amines	**Carcinogenic aromatic amines**	**µg/l**	1 each	1 each	0.1 each	0.1 each	EPA 3510C 1996 + EPA 8270D 2007 , EN 14362-1, EN 14362-3	0.1 µg/l	

Chlorinated benzenes and toluenes - chlorobenzenes		**µg/l**	100 sum	200 sum	50 sum	100 sum	EPA 5030C 2003 + EPA 8260C 2006; EPA 3510C+EPA 8270D	0.1 µg/l	
Chlorophenols		**µg/l**	0.5 each	1 each	0.5 each	1 each	EPA 3510C 1996 + EPA 8270D 2007; CNR IRSA 5070B MAN. 29/03, ISO 14154:2005	0.5 µg/l	
Phenols		**mg/l**	0.01	0.02	0.01	0.02	EPA 258	0.05 mg/l	
Allergenic colourants		**µg/l**	50 sum	50 sum	10 sum	10 sum	EP 3510C:1996 + EPA 8321B:2007 (rif. DIN 54231-2005)	0.1 µg/l	
Carcinogenic colourants		**µg/l**	50 sum	50 sum	10 sum	10 sum	EP 3510C:1996 + EPA 8321B:2007 (rif. DIN 54231-2005)	0.1 µg/l	
Colourants – others banned		**µg/l**	50 sum	50 sum	10 sum	10 sum	EP 3510C:1996 + EPA 8321B:2007 (rif. DIN 54231-2005)	0.1 µg/l	
Perfluorinated compounds	**Perfluorooctanesulfonic acid and its salts (PFOS)**	**µg/l**	0.05 each	0.05 each	0.01 each	0.01 each	ISO 25101:2009, DIN 38407-42	0.001 µg/l	**DL to be precisely ascertained in relation to effective analytical capability**
	Perfluorooctanoic acid (PFOA)						ISO 25101:2009, DIN 38407-42, ISO 18856	0.001 µg/l	**DL to be precisely ascertained in relation to effective analytical capability**
Perfluorinated compounds (others)		**µg/l**	1 each	1 each	1 each	1 each	ISO 25101:2009, DIN 38407-42	0.001 µg/l	**DL to be precisely ascertained in relation to effective analytical capability**
Organic compounds of tin		**µg/l**	1	1	0.1	0.1	ISO 17353: 2004	0.01 µg/l	
Phthalates - BBP, DEHP, DIBP, DBP, DINP		**µg/l**	10 each	10 each	10 each	10 each	EPA 3510C:1999 + EPA 8270D:2007, ISO 18856	1 µg/l	
Other phthalates		**µg/l**	50 each	50 each	10 each	10 each	EPA 3510C:1999 + EPA 8270D:2007, ISO 18856	1 µg/l	
Aromatic polycyclic hydrocarbons (PAHs)		**µg/l**	1 each	1 each	1 each	1 each	CNR IRSA MET. 5080 MAN. 29/2003, USEPA 8270. DIN 38407-39	0.05 µg/l	
Metals	**Aluminium**	**mg/l**	0.8	1,6	0.7	1,4	EPA 200.8-I 5.4 1994; UNI EN ISO 17294-2:2005	0.05 mg/l	
	Antimony	**mg/l**	0.05	0.05	0.05	0.05	EPA 200.8-I 5.4 1994; UNI EN ISO 17294-2:2005,ISO 11885	0.001 mg/l	
	Arsenic	**mg/l**	0.01	0.01	0.005	0.005	EPA 200.8-I 5.4 1994; UNI EN ISO 17294-2:2005	0.001 mg/l	
	Cadmium	**mg/l**	0.02	0.02	0.01	0.01	EPA 200.8-I 5.4 1994; UNI EN ISO 17294-2:2005, ISO 11885	0.001 mg/l	
	Cobalt	**mg/l**	0.02	0.02	0.01	0.01	EPA 200.8-I 5.4 1994; UNI EN ISO 17294-2:2005, ISO 11885	0.001 mg/l	
	Total chromium	**mg/l**	0.1	0.2	0.05	0.1	EPA 200.8-I 5.4 1994; UNI EN ISO 17294-2:2005, ISO 11885	0.002 mg/l	

	Chromium VI	**mg/l**	0.05	0.05	0.05	0.05	CNR IRSA 3150c MAN 29/2003, ISO 18412, USEPA 218.6	0.005 mg/l	
	Mercury	**mg/l**	0.004	0.004	0.001	0.001	IRSA CNR 3200 MAN. 29/03; EPA 200.8 1994; UNI EN ISO 17294-2:2005, ISO 12846 or ISO 17852, EN ISO 18412, USEPA 200.7, USEPA 6010c, USEPA 6020a	0.0002 mg/l	
	Nickel	**mg/l**	0.1	0.2	0.05	0.1	EPA 200.8-I 5.4 1994; UNI EN ISO 17294-2:2005, ISO 11885	0.001 mg/l	
	Lead	**mg/l**	0.05	0.1	0.01	0.01	EPA 200.8-I 5.4 1994; UNI EN ISO 17294-2:2005, ISO 11885	0.001 mg/l	
	Copper	**mg/l**	0.1	0.4	0.05	0.2	EPA 200.8-I 5.4 1994; UNI EN ISO 17294-2:2005, ISO 11885	0.01 mg/l	
	Zinc	**mg/l**	0.5	1	0.4	0.8	EPA 200.8-I 5.4 1994; UNI EN ISO 17294-2:2005, ISO 11885	0.01 mg/l	
Chlorinated solvents		**µg/l**	1 each	2 each	1 each	2 each	CNR IRSA 5150 MAN. 29/2003, USEPA 8260 B	0.05 µg/l	
pH			6-9	6-9	6-9	6-9	CNR - IRSA MET. 2060 MAN. 29/03; APHA 4500-H+B, ISO 10523, USEPA 150.1		

Italian legal reqisites (D. Lgs. 152/06) highlighted in green.

In the next release of these Guidelines the characteristics of sludge generated by treatment plants will also be examined.

9. PRESENCE OF SUBSTANCES IN CHEMICAL MIXTURES

IN TEXTILE CHEMICAL MIXTURES

FAMILIES OF SUBSTANCES	AUXILIARIES				FINISHES				COLOURANTS		PIGMENTS
	for chemical and mechanical spinning	for dyeing and printing	for polyester dyeing	preparation and bleaching	for oil/water repellency	softeners	flame retardants	resins and coatings	generic	dispersed	
crop protection products											
alkylphenols alkylphenol ethoxylates	x	x	x			x	x	x	x	x	x
carcinogenic amines									x	x	x
chlorobenzenes (carriers)			x							x	
chlorophenols									x	x	x
allergenic colourants										x	
carcinogenic colourants									x	x	x
perfluorinated compounds					x						
organic compounds of tin	x										
formaldehyde (AGGIUNGERE NOTA)		x	x					x	x	x	x
phthalates								x			
aromatic polycyclic hydrocarbons	x	x	x							x	x only carbon black

isocyanates								x			
heavy metals											
antimony Sb	x						x				
arsenic As	x						x				
cadmium Cd	x										x
chromium Cr	x	x							x		x
chromium VI CrVI											
cobalt Co									x	x	x
copper Cu	x								x	x	x
lead Pb									x	x	x
mercury Hg		x		x							
nickel Ni									x	x	x
nitrosamines											
short-chain							x				
chlorinated paraffins											
halogenated flame retardants							x				
chlorinated solvents								x			
organic solvents								x			

AUXILIARIES
for chemcal and mechanical spinning - lubricant oils, waxes, antistatics, additives…
for dyeing and printing - levellers, dispersants, emulsifiers, fixatives, etc.
for dyeing polyester fibres - carriers
for preparation and bleaching - optical whiteners, reducing agents, sequestrants,
for finishing - softeners, antistatics, anticreasers, oil/water repellents

IN CHEMICAL MIXTURES FOR LEATHER

FAMILIES OF SUBSTANCES	WETTING AGENTS	DELIMING AGENTS	DEGREASERS	MACERATING AGENTS	INORGANIC TANNING AGENTS	ORGANIC TANNING AGENTS	EMULSIFIERS	GREASES	PROTEIN BINDERS	WAXES AND OILS	COLOURANTS	PIGMENTS	POLYMERS	AUXILIARIES	LACQUERS AND NITROEMULSIONS
									for finishing	for finishing	generic				
crop protection products															
alkylphenols alkylphenol ethoxylates			x				x	x			x	x	x		
carcinogenic amines											x				
chlorobenzenes (carriers)															
chlorophenols											x	x			
allergenic colourants															
carcinogenic colourants											x				
perfluorinated compounds														x	
organic compounds of tin													x		
formaldehyde (AGGIUNGERE NOTA)						x					x	x	x	x	
phthalates								x							x
aromatic polycyclic hydrocarbons						x					x	x	x	x	
isocyanates													x	x	
heavy metals															
antimony Sb														x	
arsenic As														x	
cadmium Cd												x			

chromium Cr					**x**						**x**	**x**			
chromium VI CrVI															
cobalt Co											**x**	**x**			
copper Cu											**x**	**x**			
lead Pb											**x**	**x**			
mercury Hg															
nickel Ni											**x**	**x**			
nitrosamines															
short-chain chlorinated paraffins								**x**		**x**				**x**	
halogenated														**x**	
flame retardants															
chlorinated solvents															
organic solvents													**x**	**x**	**x**
organic solvents													**x**	**x**	**x**

10. TABLE OF CHEMICAL SUBSTANCES IN CHEMICAL MIXTURES

Categories	Substances	CAS	Notes
Agrochemicals (Phytosanitary products)	Aldrin	309-00-2	
	2-(2,4,5-Trichlorophenoxy)propionic acid, its salts and compounds	93-72-1	
	Azinphos-methyl	86-50-0	
	Azinphos-ethyl	2642-71-9	
	Bromophos-ethyl	4824-78-6	
	Captafol	2425-06-1	
	Carbaryl	63-25-2	
	Chlordane	57-74-9	
	Chlordecone	143-50-0	
	Chlordimeform	6164-98-3	
	Chlorfenvinphos	470-90-6	
	Coumafos	56-72-4	
	Cyfluthrin	68359-37-5	
	Cyhalothrin	91465-08-6	
	Cypermethrin	52315-07-8	
	DEF	78-48-8	
	Deltamethrin	52918-63-5	

	Diaryl halogenated alkanes	various	
	Dicrotophos	141-66-2	
	Diazinon	333-41-5	
Agrochemicals (Phytosanitary products)	Halogenated biphenyls, including Polychlorinated biphenyls (PCBs)	1336-36-3; 53469-21-9; Various	
	1-(o-Chlorophenyl)-1-(p-chlorophenyl)-2,2- dichloroethane (o,p'-DDD)	53-19-0	
	1,1-Dichloro-2,2-bis(4-chlorophenyl)ethane (p,p'- DDD)	72-54-8	
	2-(2-Chlorophenyl)-2-(4-chlorophenyl)-1,1- dichloroethene (o,p'-DDE)	3424-82-6	
	1,1-Bis(p-chlorophenyl)-2,2-dichloroethylene (p,p'- DDE)	72-55-9	
	2,4'-Dichlorodiphenyltrichloroethane (o,p'-DDT) and its isomers; preparations containing DDT and its isomers	789-02-6	
	p,p'-Dichlorodiphenyldicloroethane (p,p'-DDT) and its isomers; preparations containing DDT and its isomers	50-29-3	
	2,4-Dichlorophenoxyacetic acido, its salts and compounds	94-75-7	
	Dichlorprop	120-36-5	
	Dieldrin	60-57-1	
	Dimethoate	60-51-5	
	Dinoseb and its salts	88-85-7	
	Endosulfan	115-29-7	
	Endosulfan, alfa	959-98-8	
	Endosulfan, beta	33213-65-9	

	Endrin	72-20-8	
	Hexabromobiphenyl	36355-01-8	
	Hexachlorocyclohexane	608-73-1	
	Esfenvalerate	66230-04-4	
	Fenvalerate	51630-58-1	
	Heptachlor	76-44-8	
	Heptachlorepoxide	1024-57-3	
	Isodrin	465-73-6	
	Kelevan	4234-79-1	
Agrochemicals (Phytosanitary products)	Lindane (gamma-HCH)	58-89-9	
	Malathion	121-75-5	
	MCPA (4-Chloro-2-methylphenoxyacetic acid)	94-74-6	
	MCPB (4-(4-Chloro-o-tolyloxy)butyric acid	94-81-5	
	Mecoprop	93-65-2	
	Halogenated diphenyl methanes	various	
	Methamidophos	10265-92-6	
	Methoxychlor	72-43-5	
	Metilparathion	298-00-0	
	Mevinphos (Fosdrin)	7786-34-7	
	Monocrotophos	6923-22-4	
	Monomethyl-dibromo-diphenyl methane (DBBT)	99688-47-8	

	Monomethyl-dichloro-diphenyl methane	81161-70-8	
	Monomethyl-tetrachlorodiphenyl methane	76253-60-6	
	Halogenated naphthalenes	various	
	Parathion	56-38-2	
	Perthan	72-56-0	
	Profenofos	41198-08-7	
	Propetamphos	31218-83-4	
	Quinalphos	13593-03-8	
	Pentachloronitrobenzene (PCNB, Quintozene)	82-68-8	
	Strobane	8001-50-1	
	Telodrin	297-78-9	
	Alogenated phenols, including polychlorinated triphenyls (PCT)	various	
Agrochemicals (Phytosanitary products)	Toxaphene	8001-35-2	
	2,4,5-Trichlorophenoxyacetic acid (2,4,5-T), its salts and compounds	93-76-5	
	Trifluralin	1582-09-8	
	α− Hexachlorocyclohexane	319-84-6	
	β− Hexachlorocyclohexane	319-85-7	
	δ− Hexachlorocyclohexane	319-86-8	
Alkylphenols - Alkylphenol ethoxylates	**Alkylphenols**		
	Nonylphenol (NP), mixed isomers	25154-52-3; 104-40-5; 84852-15-3	
	Octylphenol	27193-28-8; 1806-26-4; 140-66-9	

	Alkylphenolethoxylates (APEOs)		
	Octylphenol ethoxylate (OPEO) [1-18]	9002-93-1 various	
	Nonylphenol ethoxylate (NPEO)[1-18]	9016-45-9 various	
Carcinogenic aromatic amines	p-Amminoazobenzene	60-09-3	
	o-Aminoazotoluene	97-56-3	
	4-Aminobiphenyl	92-67-1	
	2-Amino-4-nitrotoluene	99-55-8	
	2-Anisidine	90-04-0	alternative name, o-anisidina
	Benzidine	92-87-5	
	4-Chloroaniline	106-47-8	
	4-Chloro-2-toluidine	95-69-2	
	p-Cresidina	120-71-8	
	2,4-Diamminoanisole	615-05-4	
	4,4'-Diaminodiphenylmethane	101-77-9	
	2,4-Toluenediamine	95-80-7	
	3,3'-Dichlorobenzidine	91-94-1	
Carcinogenic aromatic amines	3,3'-Dimethoxybenzidine	119-90-4	
	3,3'-Dimethylbenzidine	119-93-7	
	3,3'-Dimethyl-4,4'-diamino-diphenylmethane	838-88-0	
	4,4'-Methylene-bis-(2-chloroaniline)	101-14-4	
	2-Naphthylamine	91-59-8	

	4,4'-Oxydianiline	101-80-4	
	4,4'-Thiodianiline	139-65-1	
	2-Toluidine	95-53-4	
	2,4,5-Trimethylaniline	137-17-7	
	2,4-Xylidine	95-68-1	
	2,6-Xylidine	87-62-7	
Biocides-Dimethylfumarate	Dimethylfumarate (DMFu)	624-49-7	
others	All biocides NOT present in EU Regulation 528/2012 and subsequent amendments are forbidden		
Chlorinated benzenes and toluenes - chlorobenzenes	Monochlorobenzene	108-90-7	
	Dichlorobenzene, mixed isomers	25321-22-6	
	1,2-Dichlorobenzene	95-50-1	
	1,3-Dichlorobenzene	541-73-1	
	1,4-Diclhorobenzene	106-46-7	
	Trichlorobenzene, mixed isomers	12002-48-1	
	1,2,3-Trichlorobenzene	87-61-6	
	1,2,4-Triclhorobenzene	120-82-1	
	1,3,5-trichlorobenzene	108-70-3	
	Tetrachlorobenzene, all isomers:		
	1,2,3,4-Tetrachlorobenzene	634-66-2	

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EU legislation

- (EC) Regulation No. 1907/2006 REACH on the Registration, Evaluation, Authorisation and Restriction of Chemicals;
- Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work;
- Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens or mutagens at work;
- Regulation (EC) no 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures;
- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy;
- Directive 2008/50/ec of the European Parliament on ambient air quality and cleaner air for Europe

National and International Laws

- Legislative Decree 3 April 2006, n. 152, containing environmental regulations**;**
- Legislative Decree 9 April 2008, n. 81, containing provisions for the protection of health and safety in the workplace;
- Canada – Canadian Environmental Production Act (CEPA) 1999;
- California Proposition 65;
- USA - Customs and Border protection (CBP);
    - https://www.ftc.gov/tips-advice/business-center/selected-industries/clothing-and-textiles
- USA - Toxic Substances Control Act (TSCA);

EU voluntary certifications

- 2014/350/EU: Commission Decision of 5 June 2014 establishing the ecological criteria for the award of the EU Ecolabel for textile products
- 2009/563/EC: Commission Decision of 9 July 2009 on establishing the ecological criteria for the award of the Community eco-label for footwear

International technical standards

- ISO 14001 *Environmental management systems -- Requirements with guidance for use;*
- OHSAS 18001 *Occupational Health and Safety Management*;
- ISO/IEC 17025 *General requirements for the competence of testing and calibration laboratories*.

Private voluntary certification

- ZDHC

Technical documents

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