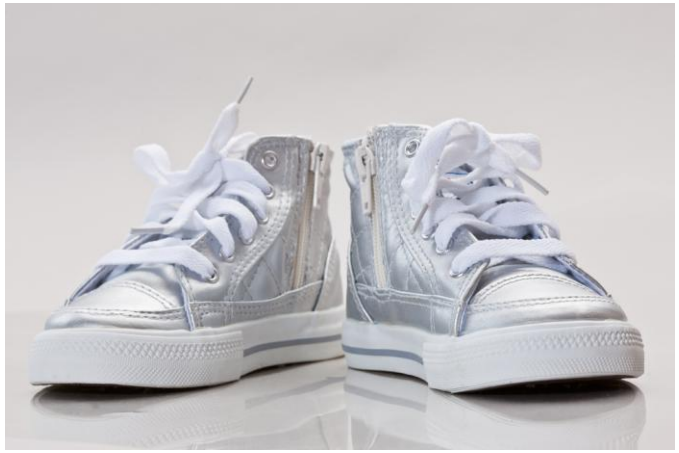
leather sustainability

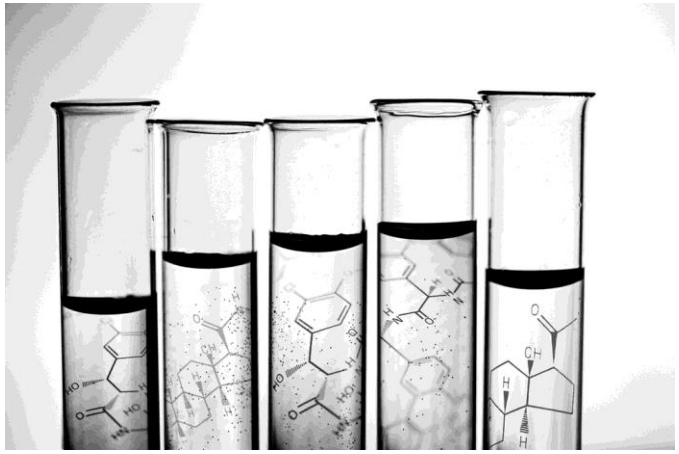
BLC Leather Technology Centre

Guide to Managing Chemical Requirements in Product

Jun 2017 Version #4

blc chemical testing





BLC have developed this guide to help companies navigate through the complexities of restricted substance legislation and ultimately to understand which chemicals are likely to be present in product currently being produced. This guide gives legislative drivers as well as possible alternative chemistries.

More specifically, in order to help companies develop a 'smart-testing' approach to managing chemical compliance, the below tier system has been developed:

Legislative Testing: Chemicals that are currently covered by International Legislation*, or based on industry counsel and intelligence, likely to be the subject of regulation in the near future. These chemicals are considered a higher risk in terms of presence in consumer products. Many of these tests and limits have been adopted by major brands and retailers.

Recommended Testing: Substances in tier two may be partially regulated outside of 'big picture' legislation and may be present in consumer products. These may also include substances subject to increasing industry pressure; for example Zero Discharge of Hazardous Chemical (ZDHC) listed chemicals.

*This covers key trading and manufacturing regions including Europe, USA and China. Even within the scope of these regions there are some 'in country' managed restrictions that may not be covered in this document. Customers are advised to seek legal counsel for absolute guidance and recommendations.

Chemical Requirements: Legislative Testing

Table 1/3

Restricted Substance	Leather	Coated Leather	Natural Textiles	Synthetic Textiles	Rubber	Plastic	Adhesive	Metal	Paint	Chemicals*	Method (or equivalent)	Requirement	Main Drivers	Alternative Chemistries*
Restricted Azo Dyes (Arylamines)	●	●	●	●							BS EN ISO 17234-1:2015 & BS EN ISO 17234-2:2011 BS EN ISO 14362-1:2017 & BS EN ISO 14362-3:2017	None-detectable (detection limit: 30 mg/kg) China – Textiles: None-detectable (detection limit: 20 mg/kg)	REACH, Prop 65, China GB	Non-restricted azo dyes, direct dyes
Chloroalkanes (C10-C13) (SCCP)	●	●			●	●				●	GC-ECD Analysis	<1500 mg/kg (Sum of C10-C13)	POP's (substances), REACH (SVHC)	Dependent on usage type
Chrome VI	●	●									BS EN ISO 17075-2:2017	None-detectable (detection limit: 3 mg/kg)	REACH, Prop 65	Chrome VI is not intentionally added to leather. Leather manufacturing processes to be tightly controlled
Dimethylfumarate (DMFu)	●	●	●	●	●	●			●		PD CEN ISO/TS 16186:2012	None-detectable (detection limit: 0.1 mg/kg)	REACH	Any desiccant sachets used should be 'pure' and free from additional chemistry

Chemical Requirements: Legislative Testing

Table 2/3

Restricted Substance	Leather	Coated Leather	Natural Textiles	Synthetic Textiles	Rubber	Plastic	Adhesive	Metal	Paint	Chemicals*	Method (or equivalent)	Requirement	Main Drivers	Alternative Chemistries*
Heavy Metals (Total Content)	●	●	●	●	●	●		●	●	●	BS EN ISO 17072-2:2011 BS EN 16711-1:2015 or as specified by U.S. CPSIA	As, Cd, Hg, Pb, Sb: <100 mg/kg in material Cd, Pb: <90 mg/kg in coating	REACH, CPSC, Prop 65	Organic pigments/ non-heavy metal pigments
Nickel Release								●			BS EN 12472:2005 + A1:2009 followed by BS EN 1811:2011+A1:2015	< 0.5 μg/cm^2/week for jewellery intended to come into direct and prolonged skin contact (Compliant when < 0.88 μg/cm^2/week) < 0.2 μg/cm^2/week for jewellery which is inserted into pierced ears and other pierced parts of the human body (Compliant when < 0.35 μg/cm^2/week)	REACH	Key is to ensure plating is sufficient to inhibit nickel release from the hardware
Alkylphenol ethoxylates (NPEO,OPEO)	●	●	●	●						●	BS EN ISO 18218-1:2015 BS EN ISO 18254-1:2016	None-detectable (detection limit: 10 mg/kg)	REACH (processing only), NGO initiatives	Research ongoing
Alkylphenols & Alkylphenol Ethoxylates (NP,NPEO,OP,OPEO)	●	●	●	●						●	BS EN ISO 18218-2:2015	None-detectable (detection limit: 10 mg/kg)	REACH (processing only), NGO initiatives	Research ongoing

Chemical Requirements: Legislative Testing

Table 3/3

Restricted Substance	Leather	Coated Leather	Natural Textiles	Synthetic Textiles	Rubber	Plastic	Adhesive	Metal	Paint	Chemicals*	Method (or equivalent)	Requirement	Main Drivers	Alternative Chemistries**
Organotins	●	●	●	●	●	●			●	●	PD CEN ISO/TS 16179:2012	<1 mg/kg per compound	REACH, Prop 65	Registered, authorised substances under BPR/EPA
Polycyclic Aromatic Hydrocarbons (PAH)					●	●					AfPS GS 2014:01	<1 mg/kg per compound	REACH, German State Law	Polycyclic Aromatic Hydrocarbons (PAH)
PFOS & PFOA	●	●	●	●						●	LC-MS Analysis	Coated Material: <1µg/m^2 of the coated material (detection limit: 0.025 mg/kg)	REACH, NGO initiatives, Norwegian State Law	Research ongoing
Restricted Phthalates		●		●		●	●		●		BS EN ISO 14389:2014 CPSC-CH-C001-09.3	<1000 mg/kg total (combined phthalates)	REACH, CPSC, Prop 65	Citrates, sebacates, adipates and phosphates
Phenols (Chlorinated) PCP,TeCP,TCP	●	●	●	●						●	BS EN ISO 17070:2015	None-detectable (detection limit: 1.0 mg/kg per compound China: None-detectable (detection limit: 0.5 mg/kg)	REACH (substances), Prop 65, China GB, Korea	Registered, authorised substances under BPR/EPA

*Compliance to a Manufacturing Restricted Substances List (MRSL), for example under ZDHC, may be required by some brands/retailers. These requirements are subject to change. The methods listed may not be appropriate for chemical/formulation testing. Further guidance should be sought.

**Please note that any alternative chemical products listed are examples only; this list is not exhaustive. New chemicals should be sourced in consultation with a reputable chemical supplier and tested accordingly for quality and safety purposes

Chemical Requirements: Recommended Testing

Table 1/2

Restricted Substance	Leather	Coated Leather	Natural Textiles	Synthetic Textiles	Rubber	Plastic	Adhesive	Metal	Paint	Chemicals*	Method (or equivalent)	Requirement	Main Drivers
Disperse Dyes (Allergenic and Carcinogenic)			●	●							BS EN ISO 16373-2:2014 or DIN 54231:2005-11	None-detectable (detection limit: 15 mg/kg)	Prop 65, German State Law
Dimethylformamide				●		●					PD CEN ISO/TS 16189:2013	<1000 mg/kg	REACH (SVHC)
Formaldehyde	●	●	●	●							BS EN ISO 17226-1:2008 BS EN ISO 14184-1:2011	Adults (All materials): <75 mg/kg Children's (leather): <20 mg/kg Children's (textiles): <16 mg/kg	Retailer and Brand Specified, Prop 65, Japanese State Law
Heavy Metals (Extractable Content) (Recommended for Children's Products)	●	●	●	●	●	●	●	●	●		BS EN 71-3:2013 +A1:2014	Al: <70,000 mg/kg, Sb: <560 mg/kg, As: <47 mg/kg, Ba: <18,750 mg/kg, B: <15,000 mg/kg, Cd: <17 mg/kg, CrIII: <460 mg/kg, CrVI: <0.2 mg/kg, Co: <130 mg/kg, Cu: <7,700 mg/kg, Pb: <160 mg/kg, Mn: <15,000 mg/kg, Hg: <94 mg/kg, Ni: <930 mg/kg, Se: <460 mg/kg, Sr: <56,000 mg/kg, Sn: <180,000 mg/kg, Organic Tin: <12 mg/kg, Zn: <46,000 mg/kg	European Toy Safety Directive

Chemical Requirements: Recommended Testing

Table 2/2

Restricted Substance	Leather	Coated Leather	Natural Textiles	Synthetic Textiles	Rubber	Plastic	Adhesive	Metal	Paint	Chemicals*	Method (or equivalent)	Requirement	Main Drivers
Nitrosamines					●	●					ISO/TC 216 N 686 - ISO/NP TS 19577	None-detectable	EU Directive 1993/11/EEC
Pesticides Screen	●	●	●								GC-MS Analysis	<1 mg/kg (Total sum)	Retailer and Brand Specified
Volatile Organic Compounds	●	●			●	●	●				Static Headspace GC-MS Analysis	As per EH40/2005 workplace exposure limits	Specified substances included under REACH, Prop 65 and brand/retailer specified
REACH Screening for Current List of SVHCs*	●	●	●	●	●	●	●	●	●		Various	<0.1% by weight of each article within a product	REACH
pH	●	●	●	●							BS EN ISO 4045:2008 BS EN ISO 3071:2006	Leather: Min 3.2** Upholstery leather: Min 3.5** Textile (in direct skin contact): 4.0-7.5*** Textile (not in direct skin contact): 4.0-9.0***	

*** For a current list of SVHC's please visit http://echa.europa.eu/candidate-list-table**

**** If pH value is below 4 or above 10, the difference figure shall be <0.7**

***** Limits taken from Oeko Tex Standard**

Click Here to download a copy of our testing request form

Please click here to view our technical notes for chemical analysis.

Information on Restricted Substances

Table 1/2

Substance or property	Description
Azo dyestuffs - Arylamines	Azo colourants are colouring agents widely used in the production of textiles and leather, the term colourant includes both pigments and dyes. Aromatic amines are produced during the degradation or breakdown of certain azo dyes and it is some of these degradation products that are restricted in textile and leather articles. There are currently 24 recognised aromatic amines restricted by various legislation worldwide. Some of these are known to be carcinogenic whilst some are only suspected to be carcinogenic.
Chlorinated Phenols	Used historically as a herbicide, pesticide, fungicide and disinfectant in natural materials; PCP is known to be toxic to humans and has been linked to some forms of cancer.
Chloralkanes (C10-C13)	Chloroalkanes are widely used in flame retardants, degreasers, metal cutting lubricants, coatings and finishes and as a fat liquor in leather making. These chemicals, which are regulated under POPs Directive, are very persistent environmental pollutants and are toxic to aquatic life.
Chrome VI	Chromium is a transition element and can exist in three stable forms known as metallic chromium, chromium III and chromium VI. It is possible that small amounts of chromium III can oxidise to the harmful chromium VI under specific conditions. Chrome VI is believed to be a dermatological irritant and, a potential human carcinogen.
Disperse Dyes	Disperse dyes are generally water-insoluble colourants that are mainly used for colouring polyester, nylon, and cellulose acetate textile fibres. Some of these dyes can cause and allergenic response and it is estimated that up to 5% of the population could have an allergic response to these substances.
Dimethyl formamide (DMFa)	Dimethylformamide (DMFa) is primarily used as a solvent in the production of polyurethane products and acrylic fibres.
Dimethyl fumarate (DMFu)	Dimethylfumarate (DMFu) has good antifungal properties and has been used as a mould inhibitor in sachets for consumer products. DMFu has been highlighted as being an allergenic sensitizer at low concentrations; as a result the products containing DMFu are not permitted to be placed on the EU market.
Formaldehyde	Formaldehyde can be toxic, allergenic and carcinogenic. Formaldehyde can be used in the finishing of leather or in certain tanning auxiliaries, primarily as a cross linking agent. Formaldehyde is also classed as a skin irritant.
Heavy Metals (inc Lead and Cadmium)	Lead and Cadmium are heavy metals, which can cause irreversible neurological damage as well as renal disease, cardiovascular defects and reproductive toxicity. Lead can be used as a stabilizer in PVC production. It can be found in metal alloys of metallic components as well as a component of pigments in leathers, textiles and paints.
Nickel Release	The presence of nickel in certain products which come into direct and prolonged skin contact, such as jewellery, may cause sensitisation of humans to nickel and may lead to allergic reactions.
Nitrosamines	Nitrosamines can be used during the manufacture of rubbers and plastics, as part of the accelerators, antioxidants, and reinforcing agents that are used to provide strength and elasticity in the final product.
NPEO's	Nonylphenols are persistent and bioaccumulative and so they can cause severe environmental problems when they are released into the environment as discharges or emissions. They are also endocrine disruptors (have adverse effects on hormones), and have had devastating effects on fish populations.

Information on Restricted Substances

Table 2/2

Substance or property	Description
Organotin compounds	Organotin compounds have many uses in the production of consumer products; however certain compounds have been highlighted by the EU as having adverse effects on human health and the environment and hence their inclusion within the REACH directive.
Pesticides	A pesticide is any substance or mixture intended for: preventing, destroying, repelling or mitigating any pest. Pesticides can cause harm to humans, animals, or the environment because they are designed to adversely affect living organisms
PFOS & PFOA	PFOS belongs to the perfluorinated surfactants which have excellent water, dirt and oil repelling properties. Compounds derived from PFOS, therefore, have numerous applications in surface finishing. The substance, however, is considered as very persistent and very bioaccumulative (vPvB) to the environment.
Polycyclic aromatic hydrocarbons (PAH)	PAH's are found in some plastic or rubber components. They are not added to the products intentionally but are present as impurities. PAH's are toxic to the environment and bioaccumulative as they readily evaporate into the air from soil or surface water, breaking down through reaction with sunlight and other chemicals in the air.
Phthalates screen	Phthalates are mainly used as plasticisers for PVC and other polymers. They can also be found in adhesives, coated leathers, plasticised components. Studies have found phthalates to be endocrine disruptors and hence the most common phthalates are widely regulated, globally – typically in products intended for children.
VOC	Volatile organic compounds are those that have high enough vapour pressure under normal conditions to significantly vapourise and enter in the air. VOCs that escape into the air contribute to air pollution and can have adverse health affects to exposed individuals. VOCs can include a variety of chemicals, including but not limited to solvents.