



Hazardous Substances Testing



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Intertek's global reach is our major strength linking suppliers in one part of the world with buyers in another. We independently inspect factories and goods in the countries of origin across the whole supply chain on behalf of clients and consumers located in the products' final market. In fact we can test the same product to a range of international standards if required.

Intertek has 576 offices offering inspection, auditing and certification services and 338 laboratories worldwide providing a wide range of standard and custom testing programmes.

Our resources are strategically placed, providing appropriate services in each country. These needs

are continuously reassessed, and we are constantly evaluating manufacturing and market trends to best serve our customers.

Intertek is in the ideal position to help our customers and clients meet the Quality, Safety and Ethical standards irrespective of their, or their customer's location in

the world. Our mix of testing, inspection, auditing and consultancy services is unparalleled in the consumer goods arena making Intertek the supplier of choice for many of the world's leading brands.

Hazardous Substances Testing

Hazardous substances in consumer products and from manufacturing processes threaten human health. These may be toxic, or cause adverse effects to health in various ways, for example, skin irritation, allergic reactions, metabolic disorders in organs, and even cancer. These substances may also be dangerous to the environment and ecosystem.

Consumers today expect safe, non-toxic and environmentally friendly consumer goods in pursuit of a higher quality and healthier life. Therefore, such hazardous substances are definitely undesirable to consumers.

Hazardous substances include:

- Formaldehyde
- Extractable heavy metals e.g. nickel, chromium, cadmium
- Pesticide and herbicide residues
- Pentachlorophenol (PCP) and 2,3,5,6 tetrachlorophenol (TeCP)
- PVC Plasticizers - phthalates
- Organotin compounds - TBT and DBT
- Azo dyestuffs
- Chlorinated organic carriers
- Biocides
- Flame retardants

Regulations in the use of Hazardous Substances

Since these substances are toxic and hazardous at different levels and in different ways, their use has to be strictly controlled and monitored. Moreover, special attention and care should be made to minimize the risks of harm, and protect the interests and safety of consumers.

Some countries have banned the use of some of these substances, and implemented different regulations and standards for their use.

Formaldehyde Content

Formaldehyde is used as a preservative in textiles, household and other consumer products. In textile products for example, it acts as a cross-linking agent together with an artificial resin to make an easy-care finish to prevent shrinkage, and give the product a crease-resistant, smooth, dry and soil-releasing finish. It is also a component of some printing inks and flame-retardant finishes.

Formaldehyde in textiles may cause strong irritation to mucous membranes and the respiratory tract, and also causes skin inflammation, allergic reactions and even certain types of cancer.

The use and release of formaldehyde has been restricted in many countries.

Extractable Heavy Metals

Materials of products like natural fibres and plastics may contain heavy metals. Heavy metals may also be introduced into the products during production processes such as dyeing, painting, manufacturing and finishing. Quite a number of heavy metals are hazardous to health, examples include:

- Nickel (Ni), chromium (Cr), cadmium (Cd), antimony (Sb), arsenic (As), lead (Pb), mercury (Hg), copper (Cu), cobalt (Co)

These heavy metals have caused major health problems in various parts of the world. Once absorbed by human bodies, they tend to accumulate in organs like liver, kidney, heart, bone and brain. The effects on health and organs can be tremendous at high accumulations. For example, mercury will affect the nervous system. Young children are especially vulnerable because of higher absorption rates of heavy metals.

Nickel

Nickel is used for plating and is a common constituent in stainless steel. It is found in alloys used for metal accessories such as earrings, necklaces, bracelets, zippers, rivet buttons and watch straps. Studies have shown that prolonged and direct skin contact may cause serious sensitisation, skin irritation and allergic reactions.

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Nickel use is restricted in Europe. The European Union has adopted the Directive 94/27/EC to control the use of nickel. The standards EN 1810, EN 1811 and EN 12472 have been implemented for analysis according to the above directive. There are specific additional controls in Denmark and Germany.

Chromium (VI)

Chromium (VI) is an undesirable by-product, generally produced by industrial processes and during the leather tanning process. It is a strong oxidant and a heavy metal that can adversely affect health and poison the environment. Chromium (VI) at high levels can damage the nose and even cause cancer.

Cadmium

Cadmium is commonly used in industry as pigment, dye, paint, stabiliser and plating for functional and decorative purposes. Therefore, it may be found in a variety of products including packaging, toys, batteries, furniture, apparel and clothing accessories, wall coverings and other products. The use of this toxic element has been restricted in some countries.

The use of cadmium is also restricted in the EU by directive 91/338/EEC. For example, the use of cadmium is limited under the Chemical Substances Act Cadmium Decree 1999 No. 149 in the Netherlands, and under the Environmental Protection (Controls on Injurious Substances) (No 2)

Regulations 1993 No. 1643 in the United Kingdom.

Pesticides and Herbicides Residues

Pesticides are used to combat insects, in the cultivation of plants and natural plant fibres like cotton. They also act as moth protection during storage. Herbicides are used to eradicate weed. Examples of pesticides and herbicides include aldrin, carbaryl, DDD, DDE, DDT, dieldrine, endosulfan, endrine, heptachlor, heptachloroepoxide, hexachlorobenzene, lindane, methoxychlor, trifluralin, etc.

The pesticide and herbicide residues are toxic in different ways.

They can be absorbed by plants and fibres, and remain in the final products. They can sometimes easily assimilate through the skin, causing irritation and even cancer. For example, lindane is a cancer-inducing pesticide.

Pentachlorophenol (PCP) and 2,3,5,6 Tetrachlorophenol (TeCP)

PCP and TeCP are directly applied on textile, leather and wood products to prevent mould spots. They are very toxic and also cancer inducing. Their chemical stability is very high, so they are not easily broken down. In Germany, the purchase and use of pentachlorophenol has been restricted to certified applicators.

PVC Plasticizers - Phthalates

Phthalates are the most popular plasticizers used to soften PVC, making plastics more flexible to enhance their workability. These plastics are useful materials for products like tools, toys and packaging. Studies showed that under simulated mouthing conditions, phthalates can be released fairly easily from the products. Different quantities of released phthalates may cause potentially hazardous effects to humans especially young children. The European Union has implemented a temporary ban of phthalates in some children's products.

Organotin Compounds - TBT & DBT

Tributyltin (TBT) is used for anti-microbial finishing. For textile products, it is used for preventing the bacterial degradation of sweat and unpleasant odours in socks, shoes and sport clothes.

Dibutyltin (DBT) is another organotin with various applications, such as intermediate for stabilizers of PVC. High concentration of these compounds are toxic. They can be absorbed through the skin and may affect the nervous system.

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Azo Dyestuffs

Azo dyestuffs are a group of synthetic dyestuffs based on nitrogen that are often used for textile garments, toys, leather wear, shoes and other materials such as feathers. Under certain conditions, some azo dyestuffs may produce carcinogenic and allergenic substances. These dyes may be absorbed through the skin with prolonged skin contact and provoke adverse effects on humans such as allergic reactions and even cancer.

Restrictions on azo dyestuffs have been introduced by Germany, Austria and the Netherlands. Their use is also restricted by the EU Directive 76/769/EEC. Azo dyestuffs that can be reduced and create certain carcinogenic amines are prohibited from being imported into the EU.

The test methods stimulates cleavage of the azo linkage in the body, with limits given for the byproducts that may be released.

Chlorinated Organic Carriers

They are used as auxiliaries in the dyeing of polyester. Chlorinated organic compounds are harmful and may induce liver malfunction, irritation to mucous membranes and skin, and reproductive disorders.

Biocides

They are used as antifungal or antibacterial agents. For textile uses, they are usually organotin or quaternary ammonium compounds. They are toxic in nature.

Flame Retardants

Flame retardants are added to textile materials to improve their flame resistance. Common examples include 2,3-dibromopropyl phosphate, polybrominated biphenyls (PBB) and polybrominated diphenylether (PBDE).

Prolonged contact to these flame retardants may cause impairment of immune system, hypothyroidism, memory loss and joint stiffness.

Hazardous Substances Testing

We provide a wide variety of testing and assessments to evaluate the content of hazardous substances present in different products in accordance to different international standards and regulations. Testing items generally include:

- Plastics
- Latex and rubber

- Metal and alloys
- Paper and paperboard
- Batteries
- Soaps and detergent
- Candle products
- Fireworks
- Fuel and lubrication oils
- Pigments and dyestuff
- Packaging materials
- Solvents
- Stuffing materials
- Sunglasses
- Textile and leather, and other materials
- Toys

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